

EXHIBIT 34

PVA

PVA

B62-1121

ISSUE DATE	4/3/06	PART/ASSEMBLY: Standard 2 gallon pressure pot, w/kalrez o-ring in filter	SHEET	1	of	1
REV. DATE			REVISION		A	

[illegible]

PVA**BILL OF MATERIAL****B62-2052**

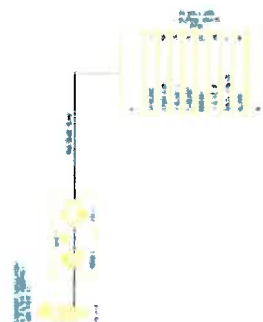
ISSUE DATE 5/8/09		PART/ASSEMBLY: Dispense System		SHEET 1 of 1			
REV. DATE 8/3/09				REVISION B			
ITEM	DESCRIPTION	SYMBOL	QTY	UNIT	REC SP	DATE	REMARKS
	Dispense drawing	163-1712	1	ref		5/8/09	
1	2-gallon pressure tank assembly	B62-1121	1	ea			Ref dwg 163-0043
2	Fitting 1/4mnpt x 3/8fnpt expander	3/8 x 1/4 FG-SS	1	ca			
3	Air fitting 1/4mnpt x 5/16 tube 90°	KQ2L09-35S	1	ea			
4	Air pressure regulator 0-60psi	AR20K-N02-Z-X406	1	ea			
5	Air pressure gauge 0-60psi	K-22	1	ea			
6	Air fitting 1/4mnpt x 1/4 tube 90°	KQ2L07-35S	1	ea			
7	Air tube 1/4od red	TU0604R	1	6ft lg			Trim if necessary
8	6oz cartridge retainer assembly	PVA-102-060	1	ea			
9	Fitting 1/4mnpt x -06ffjc SS swivel	6 F6X-SS	1	ca			
10	Fitting 3/8mnpt x -06mjic SS 90°	6-6 CTX-SS	2	ca			
11	Material / solvent ball valve	SS-44XF6	1	ca			
12	Moisture lok hose assembly, -06 x 107in long	540P-06 x 107"	1	ea			
13	Fitting 1/4mnpt x -06mjic 90°	6 CCTX	1	ca			
14	Material manifold	PM043-2	1	ca			
15	Fitting 1/4mnpt x 1/4 tube 90°	4MSEL4N-316	2	ca			
16	Teflon tube 1/4od black	TFETB01870250B	2	72" ca			Trim if necessary
17	Fitting 1/8mnpt x 1/4 tube 90	4MSEL2N-316	2	ea			
18	FCS300-ES extended spray valve	B12-1652	1	ca			Ref dwg 112-2190
19	FCM100-22G micro dot valve	B12-1788	1	ca			Ref dwg 112-2420

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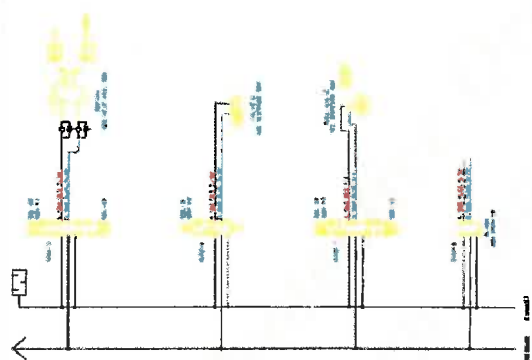
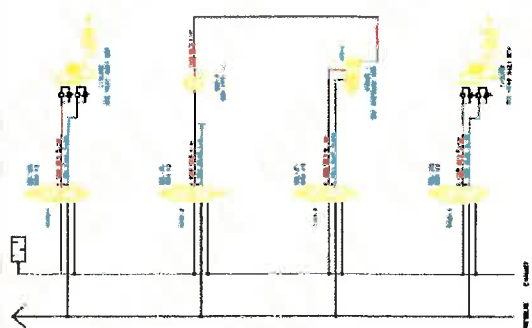
BILL OF MATERIAL

B62-3514

ISSUE DATE 6/14/12		PART/ASSEMBLY: Dispense System SPCX2115/W3267 REWORK				SHEET 1 of 1	
REV. DATE						REVISION A	
ITEM	DESCRIPTION	SYMBOL	QTY	UNIT	REC SP	DATE	REMARKS
	Dispense drawing	163-2815	1	ref			
1	Alloy 1 gallon pot	B62-2719	1	ea			163-2204
2	Fitting 3/8mmpt x -06mjic 90°	6-6 CTX-SS	2	ea			
3	Fitting 3/8fnt tee fxfxf	3/8 MMO-SS	1	ea			
4	Moisture lok hose assembly -06mjic x 8ft	B62-1409	2	ea			SS ends
5	Fitting 1/4mmpt x -06mjic 90°	6 CTX-SS	2	ca			
6	Ball valve 1/4npt (3way)	SS-43GXF4	2	ca			
7	Fitting 1/4mmpt x 1/4mmpt	1/4 FF-SS	2	ca			
8	Cartridge retainer	3232330	2	ea			
9	Air cap	8880114	2	ea			
10	Retainer mounting bracket	B12-2546	2	ea			
11	Air fitting 1/4mmpt x 1/4 tube 90°	KQ2L07-35S	4	ref			
12	Air tubing 1/4od red	TU0604R	24"	ref			
13	Precision air pressure regulator	IR2010-N02B	2	ea			
14	Air pressure gauge	K-22	2	ca			
15	Air fitting 1/4mmpt x 5/16 tube 90°	KQ2L09-35S	2	ref			
16	Fitting 1/4mmpt x 1/4tube	4MSC4N-316	2	ca			
17	Teflon tube 1/4 od black	TFETB01870250B	72"	ref			
18	Fitting 1/4tube bulkhead	4BC4-316	2	ca			
19	Fitting 1/8mmpt x 1/4tube 90°	4MSEL2N-316	2	ea			
20	FCS300-ES extended spray valve	FCS300-ES	1	ref			Customer already has B12-1652, 112-2190
21	FC100-MC dispense valve	FC100-MC	1	ca			B12-1662, 112-2196



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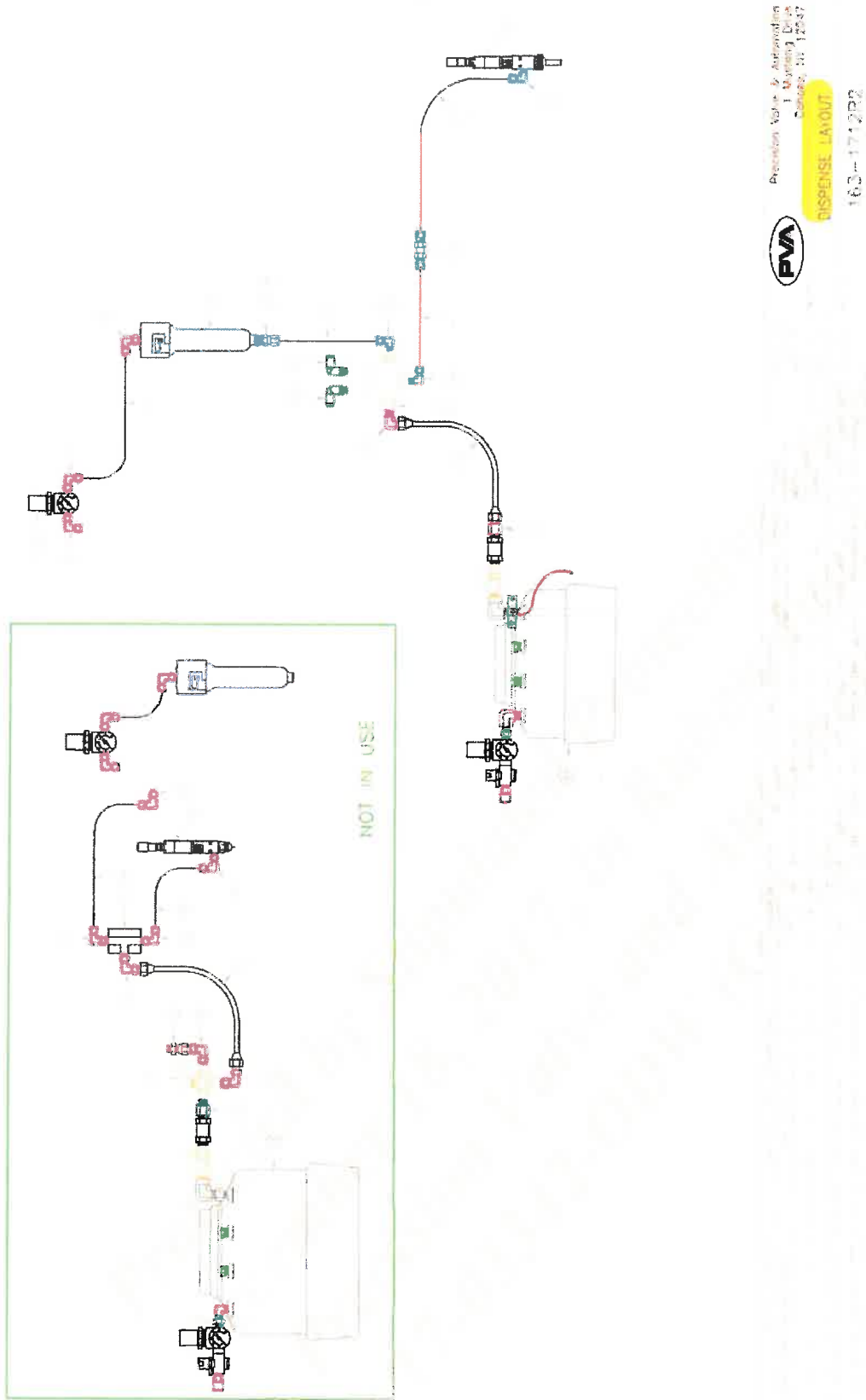


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Engineering/Design Drawing: Proprietary

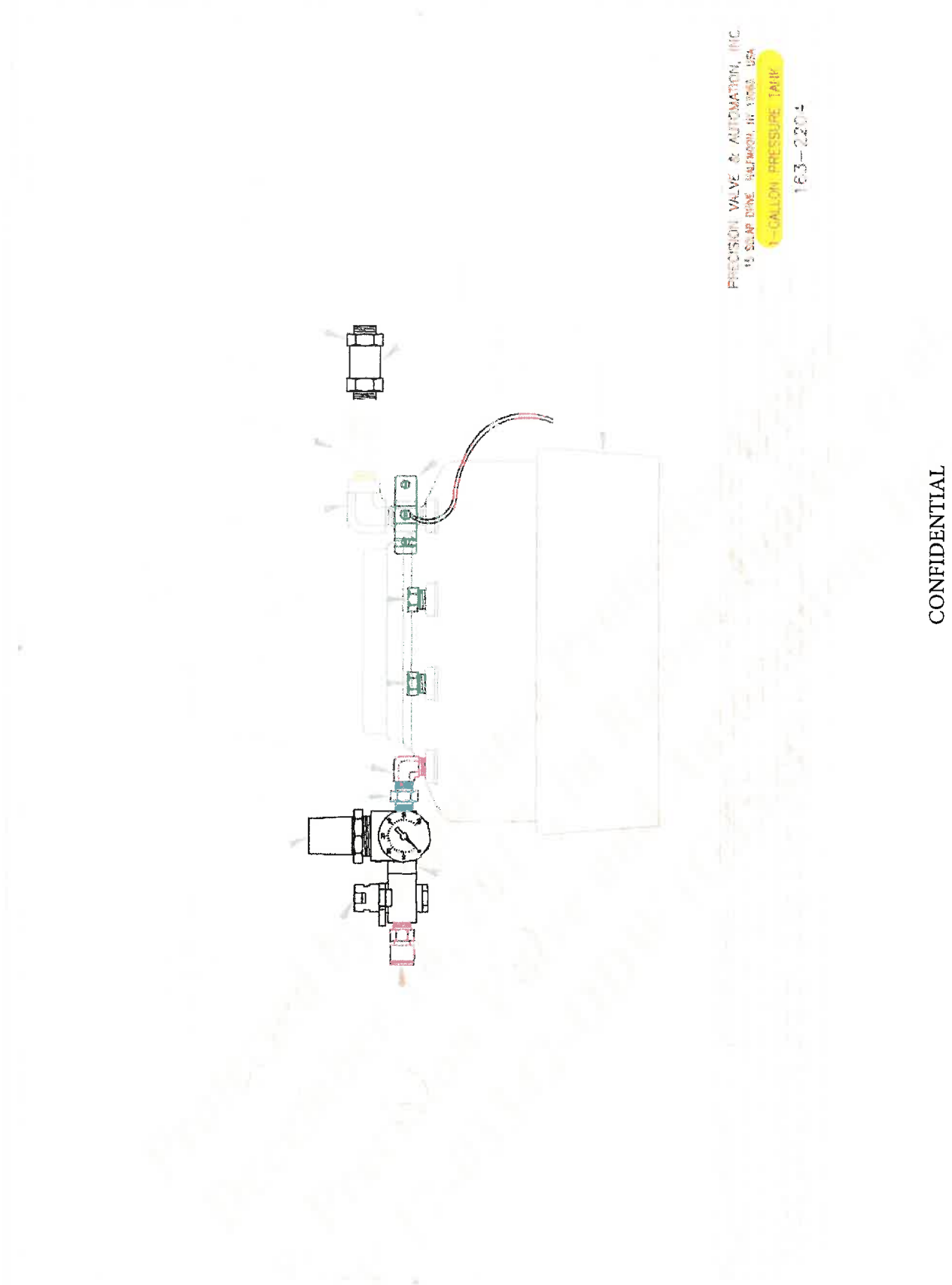
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CONFIDENTIAL
Engineering/Design Drawing: Proprietary

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Engineering/Design Drawing: Proprietary

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BILL OF MATERIAL

B32-0149R2

ISSUE DATE	10/14/13	PART/ASSEMBLY: Pneumatic Assembly, 8-Station Manifold	SHEET	1	of	1
REV. DATE			REVISION			A

ITEM	DESCRIPTION	PART NUMBER	QTY	UNIT	ECN#	REMARKS
	Pneumatic Schematic	<u>I13-0204R2</u>	REF			
1	Lockout, Filter/Regulator Assembly	AC20-F2H01A	1	REF		
2	Manifold, 8-Station	VV5Q11-08N3FS0-NS	1	EA		
3	Solenoid, 2-Position	VQ1101-51	5	EA		
4	Solenoid, 3-Position, Center Closed	VQ1301-51	2	EA		
5	Blank Station	VVQ1000-10A-1	1	EA		
6	Regulator, Atomizing Air, 0-5 psi	IR1000-N01-X81	1	EA		
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BILL OF MATERIAL										
B62-2052R2										
ISSUE DATE		10/8/13	PART/ASSEMBLY:		Dispense System: SPCX2115/ W3267R2		SHEET 1 of 2			
REV. DATE		10/25/13	Updated fitting part number		REVISION B					
ITEM	DESCRIPTION				SYMBOL	QTY	UNIT	REC SP	DATE	REMARKS
	Dispense drawing				163-1712R2	1	Ref			Parts 1-19 ref on B62-2052
1	2-gallon pressure tank assembly				B62-1121	1	Ref			Ref dwg 163-0043
2	Fitting 1/4mmpt x 3/8fpt expander				3/8 x 1/4 FG-SS	1	Ref			
3	Air fitting 1/4mmpt x 5/16 tube 90°				KQ2L09-3SS	1	Ref			
4	Air pressure regulator 0-60psi				AR20K-N02-Z-X406	1	Ref			
5	Air pressure gauge 0-60psi				K-22	1	Ref			
6	Air fitting 1/4mmpt x 1/4 tube 90°				KQ2L07-3SS	1	Ref			
7	Air tube 1/4od red x 6ft long				TU0604R	1	Ref			Trim if necessary
8	6oz cartridge retainer assembly				PVA-102-060	1	Ref			
9	Fitting 1/4mmpt x -06fjc SS swivel				6 F6X-SS	1	Ref			
10	Fitting 3/8mmpt x -06mjc SS 90°				6-6 CTX-SS	2	Ref			
11	Material / solvent ball valve				SS-44XF6	1	Ref			
12	Moisture lok hose assembly -06 x 107in long				540P-06 x 107"	1	Ref			Use SS crimp ends
13	Fitting 1/4mmpt x -06mjc 90°				6 CCTX	1	Ref			
14	Material manifold				PM043-2	1	Ref			
15	Fitting 1/4mmpt x 1/4 tube 90°				4MSEL4N-316	2	Ref			
16	Teflon tube 1/4od black x 72" long				TFETB01870250B	2	Ref			Trim if necessary
17	Fitting 1/8mmpt x 1/4 tube 90				4MSEL2N-316	2	Ref			
18	FCS300-ES extended spray valve				B12-1652	1	Ref			Ref dwg 112-2190
19	FCM100-22G micro dot valve				B12-1788	1	Ref			Ref dwg 112-2420
20	One gallon pressure tank assembly				B62-2719	1	Ea			Alloy, 163-2204
21	Fitting: 3/8fpt x -06mjc, SS				6-6 GTX-SS	1	Ea			
22	Urethane coated S braided Teflon hose assembly: -06 x 8ft				B62-2365	1	Ea			Includes two 1069IN-6-6C hose ends
23	Fitting: 1/4mmpt x -06mjc 90, SS				6 CCTX-SS	1	Ea		10/25/13	REV B
24	Ball valve: 1/4fpt, 3 way, pneumatically operated				SS-43GXF4-51D	1	Ea			

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PVA**BILL OF MATERIAL****B72-01433**

ISSUE DATE	10/8/13	PART/ASSEMBLY: SPCX2115/W3267R2	SHEET	1	of	1
REV. DATE	10/25/13	Updated fitting part numbers. REV B	REVISION	B		

ITEM	DESCRIPTION	PART NUMBER	QTY	UNIT	ECN#	REMARKS
1	One gallon pressure tank assembly	B62-2719	1	Ea		Alloy: 163-2204
2	Fitting: 3/8Inpt x -06Injic. SS	6-6 GTX-SS	1	Ea		
3	Urethane coated S braided Teflon hose assembly: -06 x 8ft	B62-2365	1	Ea		Includes two 1069IN-6-6C hose ends
4	Fitting: 1/4Inpt x -06Injic 90, SS	6 GTX-SS	1	Ea		REV B. 10/25/13
5	Ball valve: 1/4Inpt. 3 way, pneumatically operated	SS-43GXF4-51D	1	Ea		
6	Air fitting: 1/8Inpt x 1/4Inch 90	KQ2L07-34S	2	Ea		
7	Fitting: 1/4Inpt x 1/4Inch 90	4MSEL4N-316	2	Ea		
8	Teflon material tubing: black, 1/4od x 10ft	TFETB01870250B	3	Ea		Trim as needed
9	Fitting: 1/4Inpt x 1/4Inch	4MSC4N-316	1	Ea		
10	Material cartridge: hose clamp	5388K16	1	Ea		
11	Fitting: 1/4Inch x 1/4Inch bulkhead	4BC4-316	1	Ea		
12	Fitting: 1/8Inpt x 1/4Inch 90	4MSEL2N-316	1	Ea		
13	Solenoid, 3-position	VQ1301-51	1	Ea		
14	Air tubing: red, 1/4od x 15ft	TU0604R	1	Ea		Trim as needed, not shown
15	Air tubing: blue, 1/4od x 15ft	TU0604BU	1	Ea		Trim as needed, not shown
16	Electrical Schematic Drawing	123-2435R2	1	Ref		Software updated needed
17	Output Module	SNAP-ODC5SNK	1	Ea		
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PVA\SPCX2115\W3267R2\Prog\10-24-2013\

REM Machine Style: 350_W3SD
NO Author: JBB Date: 10/09/2006 Version: 1.00
NO Project: SPCX2115 Serial #: W3267 Company: Space X
NO Modified by: NS Date: 5/1/09
REM PathMaster version: 2.00+
REM
REM
REM
REM Revision History
REM
REM Change: Date: By:
REM
REM - Added Teach Pendant Routines. 7/3/02 TMB
REM - Added Solvent Cup Routines. 7/3/02 TMB
REM - Added Z Axis Scaling (Requires n17e firmware). 2/06/04 TMB
REM 2- Modified Cal routine, Solvent position 6/23/09 AH
REM 3- Added Y offset to Home Routine. 7/2/09 AJH
REM 5- Added Auto Solvent Flush 10/11/13 FP
REM 8- Adjusted purge points 10/24/13 MRL

REM
REM
REM This software, including the information contained
REM herein, is the property of Precision Valve & Automation,
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REM Precision Valve & Automation, Inc.

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REM

REM !!!! Startup And Scan Routines (Thread 0) !!!!
#AUTO;PASSED=0;POS_VAL=0;FANPASS=0
#AUTO1;DOG=40;TRY_RES=0;SDE=0
#AUTO2;AB1;JS#SCALE;JS#PRE_CHK
#SCAN;AP_TE=(TIME-AP_TP)*AP_EN;JP#FESTOP,(@IN[iFLOW]*XFL_EN)=1
JP#ESTOP,@IN[iESTOP]=1
JP#ESTOP,(1-@IN[iDOOR])&DRFLAG=1
JP#ESTOP,(1-@IN[iDOOR])&@IN[iBYPASS]=1
JP#ESTOP,LL_ERR<0;DOG=67
JP#ESTOP,VPNT0=1
JS#OSTOP,(OUTAC+@IN[FKEY1])=0;FPOWER=1;JP#SCAN
#OSTOP;CSTOP=1;EN
#FESTOP;FAN_ERR=1;JP#ESTOP

REM !!!! Auxiliary Error Routines (Thread 1) !!!!
#KEYMON;JP#KEYMON,MERR*(1-@IN[FKEY1])<>-1;KEY1=1;EN

REM !!!! Emergency Stop and Error Routine (Thread 0) !!!!
#ESTOP;ETIME=TIME;HX1;HX2;HX3
OP \$EF,\$FFFF,\$FFFF,\$FFFF,\$FFFF
WT100;AB1;MO;KEY1=0;MEC=20
JS#SS_ER;ERX=30000;ERY=30000;ERZ=30000;MERR=0;TEACH=0;FPOWER=0;XQ#KEYMON,2
#ESTOP1;WT150;MEC=1;JP#S200,@IN[iESTOP]=1

3267_M08.txt[8/25/2017 9:14:31 AM]

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2013\

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EXHIBIT 34
Software Code: Proprietary/irrelevant

```
MEC=3;JP#S200,(1-@IN[iDOOR])&@IN[iBYPASS]=1
MEC=3;JP#S200,DRFLAG&(1-@IN[iDOOR])=1
MEC=4;JP#S210,LL_ERR=14;MEC=5;JP#S210,LL_ERR=39
MEC=6;JP#S198,FAN_ERR=1
MEC=7;JP#S199,VPNT0=1;JP#ESTOP2,POS_VAL=0
MEC=1;JP#S208,KEY1=0;JS#FKEYREL;MERR=0
ERX=1000,ERY=1000,ERZ=1000;JS#DR_CLOS,PING=0;AP_OUT=1
MODE=0
HX1;HX2;ACFLAG=0;VLV=VSTORE;SB5;WT700;CS;SH;WT100;XQ#CS_MN1,1;JP#SCAN
#ESTOP2;MERR=-2;JS#S209;JS#WAIT_F1;HX1;HX2;ZS0;DP 0,0,0;JP#AUTO1
```

REM !!!! Command Error Routine (Thread 0) !!!!

```
#CMDERR;HX1;HX2;HX3;ST;AM;MO
OP $EF,$FFF,$FFF,$FFF,$FFF
SH;TEACH=0;FPOWER=0;ERR=_TC;MEC=11
LINE=_ED;MERR=11;JS#SS_ER;JP#GSERR,SDE=41;JP#RESET,INIT*ERR=9
JP#RESET,INIT*ERR=83;JS#S201;JS#FKEYREL;JS#ER_WT;HX1;JP#AUTO1
#GSERR;JS#S206;HX
```

REM !!!! Position Error Routine (Thread 0) !!!!

```
#POSERR;HX1;HX2;HX3;JS#S202;ST;AM;MO
OP $EF,$FFF,$FFF,$FFF,$FFF
TEACH=0;POS_VAL=0;FPOWER=0
MEC=12;MERR=12;JS#SS_ER;JS#FKEYREL;JS#ER_WT
HX1;ZS0;DP 0,0,0;JP#AUTO1
```

REM !!!! Limit Error Routine (Thread 0) !!!!

```
#LIMSWI;TEACH=0;JP#LS_HOME,HOMING=1;POS_VAL=0;HX1;HX2;HX3;JS#S203;ST;AM;MO
MEC=13;MERR=13;JS#SS_ER,FPOWER=0
OP $EF,$FFF,$FFF,$FFF,$FFF
JS#FKEYREL
JS#ER_WT;HX1;ZS0;DP 0,0,0;JP#AUTO1
#LS_HOME;RE
```

REM !!!! Startup Delay for Fan !!!!

```
#FAN_WT;HX1;FAN_WT=60000
FAN_INC=1000;JS#S159;WT2000;JP#FAN_ER,@IN[iFLOW]=1;JS#S160
#FAN_WT1;WT FAN_INC;JS#S161;FAN_WT=(FAN_WT-FAN_INC)
JP#FAN_ER,@IN[iFLOW]=1;JP#FAN_WT1,FAN_WT>0;FAN_ERR=0;FANPASS=1;EN
#FAN_ER;ZS1;FAN_ERR=1;FANPASS=0;JP#ESTOP
```

REM !!!! Machine Error Subroutines (Thread 0) !!!!

```
#ER_WT;JP#NOOP,@IN[FKEY1]=0;JP#ER_ST,@IN[FKEY5]=0;JP#ER_WT
#ER_ST;JS#FKEYREL;JS#SS_MN;JS#ER_SC;JP#ER_WT
#ER_SC;JS#FKEYREL;JS#S201,MERR=11;JS#S202,MERR=12;JS#S203,MERR=13;EN
```

REM !!!! Pre-Start Routines !!!!

```
#PRE_CHK;JS#INIT;JS#FAN_WT,((1-FANPASS)*XFL_EN)=1;JS#SF_MN,PASSED=0;SB5
JP#PRE_HM,POS_VAL=0;ACM_ER=-(@ABS[_TEX]+@ABS[_TEY]+@ABS[_TEZ])
JP#PRE_HM,ACM_ER>800;XQ#CS_MN1,1;EN
#PRE_HM;POS_VAL=0;XQ#CS_MN,1;EN
```

REM !!!! Start-up Safety Check (Thread 0) !!!!

```
#SF_MN;MO;CHECK=0;VFAIL=0
```

```

JS#CLS;JS#L1;MG{P2}{N}"Machine Safety Check"
VESPP=1;VDSPP=1;JS#L2;MG{P2}{N}"Press F1 to initiate."
JS#WAIT_F1
#SF_LP;JP#SF_FE,VFAIL=1;JP#SF_FD,VFAIL=2;JP#SF_FP,VFAIL=5
JP#SF_NE,@IN[iESTOP]=1;JP#SF_ND,@IN[iDOOR]=0;JP#SF_NK,@IN[iBYPASS]=0
JP#SF_CP,CHECK=0;JP#SF_CE,CHECK=1;JP#SF_CD,CHECK=2;PASSED=1;EN

#SF_NE;JS#CLS;JS#L1;MG{P2}{N}"Undo the EStop button.";CKSEN=iESTOP
JS#S_ZERO;JP#SF_LP
#SF_ND;JS#CLS;JS#L1;MG{P2}{N}"Close the door.";CKSEN=iDOOR
JS#S_ONE;JP#SF_LP
#SF_NK;JS#CLS;JS#L1;MG{P2}{N}"Turn the Door Bypass key to OFF";CKSEN=iBYPASS
JS#S_ONE;JP#SF_LP
#SF_CP;CB5;VCHECK=iPOWER;VSTATE=0;VFAIL=5;JS#SF_DD;JP#SF_LP,VFAIL<0;SB5
VFAIL=5;VSTATE=1;JS#SF_DD;CHECK=1;JP#SF_LP
#SF_CE;VCHECK=iESTOP;JS#CLS;JS#L1;MG{P2}{N}"Press the EStop button.";VESPP=1
VSTATE=1;VFAIL=1;JS#SF_DD;JP#SF_LP,VFAIL<0;VCHECK=iPOWER;VSTATE=0;VFAIL=5
VESPP=0;JS#SF_DD;VESPP=1;CHECK=2;JP#SF_LP
#SF_CD;VCHECK=iDOOR;JS#CLS;JS#L1;MG{P2}{N}"Open the door.";VDSPP=1
VSTATE=0;VFAIL=2;JS#SF_DD;JP#SF_LP,VFAIL<0;VCHECK=iPOWER;VSTATE=0;VFAIL=5
VDSPP=0;JS#SF_DD;VDSPP=1;CHECK=3;JP#SF_LP
#SF_DD,SFTMR=TIME;WT500
#SF_DD1;JP#SF_DD2,(VFAIL-1)*(@IN[iESTOP])*VESPP<0
JP#SF_DD2,(VFAIL-2)*(1-@IN[iDOOR])*VDSPP<0
JP#SF_DD2,@IN[iBYPASS]=0
JP#NOOP,(TIME-SFTMR)>8000;JP#SF_DD1,@IN[VCHECK]<0;VSTATE;VFAIL=0;EN
#SF_DD2;ZS1;VFAIL=0;JP#SF_LP
#SF_FP;CB5;JS#CLS;JS#L1;MG{P2}{N}"Power check failed.";JP#SF_FAIL
#SF_FE;JS#CLS;JS#L1;MG{P2}{N}"EStop button failed.";JP#SF_FAIL
#SF_FD;JS#CLS;JS#L1;MG{P2}{N}"Door safety failed.";JP#SF_FAIL
#SF_FAIL;JP#SF_OVER,SAFE<0;JS#L2;MG{P2}{N}"Press F1 to repeat test."
JS#WAIT_F1;SAFE=1;JP#SF_MN
#SF_OVER;JS#L2;MG{P2}{N}"Repair and restart machine.";ZS0;HX

REM !!!! Program Status Report (Thread 0 or 1) !!!!
#SS_MN;JS#CLS
JS#L1;MG{P2}{N}"Machine Status Report. Press ";MG{P2}{N}"F1 to "
JS#L2;MG{P2}{N}"scroll through screens or F8 t";MG{P2}{N}"o quit. "
JS#SS_LP

JS#CLS;JS#L1;MG{P2}{N}"X-axis Enc.Pos. Com.Pos. P"
MG{P2}{N}"os.Err. "
JS#L2;MG{P2}{N}" ",{F6.0}_TPX," ",{F6.0}_RPX," ",{F6.0}_TEX
JS#SS_LP

JS#CLS
JS#L1;MG{P2}{N}"Y-axis Enc.Pos. Com.Pos. P";MG{P2}{N}"os.Err. "
JS#L2;MG{P2}{N}" ",{F6.0}_TPY," ",{F6.0}_RPY," ",{F6.0}_TEY
JS#SS_LP

JS#CLS
JS#L1;MG{P2}{N}"Z-axis Enc.Pos. Com.Pos. P";MG{P2}{N}"os.Err. "
JS#L2;MG{P2}{N}" ",{F6.0}_TPZ," ",{F6.0}_RPZ," ",{F6.0}_TEZ
JS#SS_LP

```

```
JS#CLS;N1=_MOX;JS#L1;MG{P2}{N}"X-axis Motors On/Off Torque"  
MG{P2}{N}" Tor.Lim.";JS#L2;MG{P2}{N}" ",HLW[N1]{S3}  
MG{P2}{N}" ",{F1.4}_TTX," ",{F1.4}_TLX  
JS#SS_LP
```

```
JS#CLS;N1=_MOY;JS#L1;MG{P2}{N}"Y-axis Motors On/Off Torque"  
MG{P2}{N}" Tor.Lim.";JS#L2;MG{P2}{N}" ",HLW[N1]{S3}  
MG{P2}{N}" ",{F1.4}_TTY," ",{F1.4}_TLY  
JS#SS_LP
```

```
JS#CLS;N1=_MOZ;JS#L1;MG{P2}{N}"Z-axis Motors On/Off Torque"  
MG{P2}{N}" Tor.Lim.";JS#L2;MG{P2}{N}" ",HLW[N1]{S3}  
MG{P2}{N}" ",{F1.4}_TTZ," ",{F1.4}_TLZ  
JS#SS_LP
```

```
JS#CLS;N1=_HMX;N2=_LFX;N3=_LRX  
JS#L1;MG{P2}{N}"X-axis Sensors Home For.Lim.";MG{P2}{N}" Rev.Lim."  
JS#L2;MG{P2}{N}" ",HLW[N1]{S3}," ",HLW[N2]{S3}  
MG{P2}{N}" ",HLW[N3]{S3}  
JS#SS_LP
```

```
JS#CLS;N1=_HMY;N2=_LFY;N3=_LRY  
JS#L1;MG{P2}{N}"Y-axis Sensors Home For.Lim.";MG{P2}{N}" Rev.Lim."  
JS#L2;MG{P2}{N}" ",HLW[N1]{S3}," ",HLW[N2]{S3}  
MG{P2}{N}" ",HLW[N3]{S3}  
JS#SS_LP
```

```
JS#CLS;N1=_HMZ;N2=_LFZ;N3=_LRZ  
JS#L1;MG{P2}{N}"Z-axis Sensors Home For.Lim.";MG{P2}{N}" Rev.Lim."  
JS#L2;MG{P2}{N}" ",HLW[N1]{S3}," ",HLW[N2]{S3}  
MG{P2}{N}" ",HLW[N3]{S3}  
JS#SS_LP
```

```
JS#CLS  
JS#L1;MG{P2}{N}"X-axis Tuning KD KP ";MG{P2}{N}" KI "  
JS#L2;MG{P2}{N}" ",{F3.2}_KDX," ",{F3.2}_KPY," ",{F3.2}_KIX  
JS#SS_LP
```

```
JS#CLS  
JS#L1;MG{P2}{N}"Y-axis Tuning KD KP ";MG{P2}{N}" KI "  
JS#L2;MG{P2}{N}" ",{F3.2}_KDY," ",{F3.2}_KPY," ",{F3.2}_KIY  
JS#SS_LP
```

```
JS#CLS  
JS#L1;MG{P2}{N}"Z-axis Tuning KD KP ";MG{P2}{N}" KI "  
JS#L2;MG{P2}{N}" ",{F3.2}_KDZ," ",{F3.2}_KPZ," ",{F3.2}_KIZ  
JS#SS_LP;EN
```

```
#SS_LP;JP#WAIT_F1,@IN[FKEY1]=0;JP#SS_LP1,@IN[FKEY8]=0;JP#SS_LP  
#SS_LP1;ZS1;JS#FKEYREL;EN  
#SS_ER;JP#NOOP,REPORT=0;MG;MG"Error Cause: "{N};MG HLW[MEC]{S}  
MG"E-Stop:"{N};MG@IN[iESTOP]{F1.0}
```

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```
MG"Door:"{N};MG@IN[iDOOR]{F1.0}
MG"Door Bypass:"{N};MG@IN[iBYPASS]{F1.0}
MG"Exhaust Flow:"{N};MG@IN[iFLOW]{F1.0}
MG"Material A Level:"{N};MG@IN[iLEVELA]{F1.0}
MG"Material B Level:"{N};MG@IN[iLEVELB]{F1.0}
MG"Stop Codes (x,y,z)";MG_SCX{F3.0}{N};MG_SCY{F3.0}{N}
MG_SCZ{F3.0}{N}
MG"Current Error: "{N};TC1;MG"Error on line:",{F3.0}LINE
MG"Current Position (x,y,z)";TPXYZ{F6.0}
MG"Position Error (x,y,z)";TEXYZ{F6.0};EN
```

REM !!!! Initialization Routine (Thread 0) !!!!

```
#INIT;HX1,HX2,HX3;INIT=0;PMX=2;CO 14
OP $EF,$FFF,$FFF,$FFF,$FFF
CS;JS#INITLCD,JS#S001;WT2000;DA*[0];JS#FKEYREL
DM PT_SBY[4],PT_CAL[4],PT_APG[4],A_HEAD[5],AXIS[6],ASTRSK[4],HLW[30]
DM R_HEAD[5],OPF1[20],OPF2[20],OPF3[20],OPF4[20],ECOD1[10],ECOD2[10]
DM ECOD3[10],ECOD4[10],ECOD5[10],A2HEAD[5],PT_SOL[5]
ASTRSK[0]=" ";ASTRSK[1]="*";ASTRSK[2]="*";FPOWER=0;KEY1=0
ASTRSK[3]=" ";HLW[0]="ON ";HLW[1]="OFF";HLW[2]="OFF";HLW[3]="ON "
HLW[11]="ComErr";HLW[12]="PosErr";HLW[13]="LimErr";HLW[20]="I/O "
AXIS[1]="X&Y";AXIS[2]="X ";AXIS[3]="Y ";AXIS[4]="Z ";ERR=0;LINE=0;REPORT=0
AXIS[5]="W ";OUTAC=1;VLV=1;HOMING=1;VPNT0=0;SAFE=0;TEACH=0;MODE=0;ST_BY=0
AP_TE=0;AP_TP=TIME;ACFLAG=0;VSTORE=1;CAXIS=1;CHEAD=1;PLYBCK=0;FAN_ERR=0
PNEC=0;PING=0;ACINPT=0;VCLEAR=0;AP_OUT=1;FLSO_TM=TIME
DRFLAG=1;MERR=0;JS#GETASN;JS#IMACH,SDE=41;GS#IPROG,#EOM;SDE=0;JS#IPROG
LL_ERR=0;INIT=1;JP#INIT2,CPROG<=KNPROG,CPROG=1
#INIT2;JS#LPPROG;JS#CHECK;INIT=0;EN
```

REM !!!! Check Variables And Reset Routines (Thread 0) !!!!

```
#CHECK;JP#RESET,CPROG<1;JP#RESET,CPROG>KNPROG;JP#RESET,CCNT<0
JP#RESET,FANPASS<0;JP#RESET,POS_VAL<0
JP#RESET,FNF_EN<0
JP#RESET,FNF_TM<0
JP#RESET,FLUSH_TM<0
JP#RESET,FILL_TM<0
JP#RESET,SOLVENT<0
```

EN

```
#RESET;JS#S204;WT2000;JP#S205,TRY_RES=1,HX1,HX2,HX3
DA*,*[0];CCNT=0;CPROG=1;FANPASS=0;POS_VAL=0
FNF_EN=0
FNF_TM=1800000
FLUSH_TM=30000
FILL_TM=30000
SOLVENT=0
TRY_RES=1;PASSED=0;JS#S100;ZS0;JP#AUTO2
```

REM !!!! Load Program Routine (Thread 0) !!!!

```
#LPPROG;SDE=41;JP#LP2,CPROG>1;GS#PROG1,#PROG;JP#LX
#LP2;JP#LP4,CPROG>3;GS#PROG2,#PROG;JP#LX,CPROG=2;GS#PROG3,#PROG;JP#LX
#LP4;JP#LP6,CPROG>5;GS#PROG4,#PROG;JP#LX,CPROG=4;GS#PROG5,#PROG;JP#LX
#LP6;JP#LP8,CPROG>7;GS#PROG6,#PROG;JP#LX,CPROG=6;GS#PROG7,#PROG;JP#LX
#LP8;JP#LP10,CPROG>9;GS#PROG8,#PROG;JP#LX,CPROG=8;GS#PROG9,#PROG;JP#LX
#LP10;JP#LP12,CPROG>11;GS#PROG10,#PROG;JP#LX,CPROG=10;GS#PROG11,#PROG;JP#LX
```

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```
#LP12;JP#LP14,CPROG>13;GS#PROG12,#PROG;JP#LX,CPROG=12;GS#PROG13,#PROG;JP#LX
#LP14;JP#LP16,CPROG>15;GS#PROG14,#PROG;JP#LX,CPROG=14;GS#PROG15,#PROG;JP#LX
#LP16;JP#LP18,CPROG>17;GS#PROG16,#PROG;JP#LX,CPROG=16;GS#PROG17,#PROG;JP#LX
#LP18;JP#LP20,CPROG>19;GS#PROG18,#PROG;JP#LX,CPROG=18;GS#PROG19,#PROG;JP#LX
#LP20;JP#LP22,CPROG>21;GS#PROG20,#PROG;JP#LX,CPROG=20;GS#PROG21,#PROG;JP#LX
#LP22;JP#LP24,CPROG>23;GS#PROG22,#PROG;JP#LX,CPROG=22;GS#PROG23,#PROG;JP#LX
#LP24;JP#LP26,CPROG>25;GS#PROG24,#PROG;JP#LX,CPROG=24;GS#PROG25,#PROG;JP#LX
#LP26;JP#LP28,CPROG>27;GS#PROG26,#PROG;JP#LX,CPROG=26;GS#PROG27,#PROG;JP#LX
#LP28;JP#LP30,CPROG>29;GS#PROG28,#PROG;JP#LX,CPROG=28;GS#PROG29,#PROG;JP#LX
#LP30;JP#LP32,CPROG>31;GS#PROG30,#PROG;JP#LX,CPROG=30;GS#PROG31,#PROG;JP#LX
#LP32;GS#PROG32,#PROG;JP#LX
#LX,SDE=0;EN
```

REM !!!! Home Routine (Thread 1) !!!!

```
#MV_HOME;JS#DR_CLOS;JS#S019;POS_VAL=0;HOMING=1
JS#TUNE;ST;AM
FL 200000,200000,200000
BL -200000,-200000,-200000
AC 150000,150000,150000/SCALE_Z
DC 150000,150000,150000/SCALE_Z
OE 1,1,1;JS#ALLUP,ERX=1000;ERY=1000,ERZ=1000;SH
FEZ;SPZ=30000/SCALE_Z;BGZ;AMZ;PR,,1500;BGZ;AMZ
FEZ;SPZ=2000/SCALE_Z;BGZ;AMZ;PR,,1000;SPZ=20000/SCALE_Z;BGZ;AMZ;DPZ=0
FLZ=30000,BLZ=-3000
FEXY;SP 10000,10000;BGXY;AMXY;PR 3000,3000;SP 500,500;BGXY;AMXY
FEXY;SP 500,500;BGXY;AMXY;PR 3000,3000;SP 2000,2000;BGXY;AMXY
DP 0,-703;JS#TUNE,POS_VAL=1;HOMING=0;EN
```

REM !!!! Move To Stand-By Routine (Thread 1) !!!!

```
#MV_SBY;JS#DR_CLOS;JS#ALLUP;SP 60000,60000,100000/SCALE_Z
AC 150000,150000,150000/SCALE_Z;DC 150000,150000,150000/SCALE_Z
SH;DELTAS=@ABS[_TPX-PT_SBY[0]]+@ABS[_TPY-PT_SBY[1]]+@ABS[_TPZ-PT_SBY[2]]
JS#SAFEZ,DELTAS>10
PA PT_SBY[0],PT_SBY[1],PT_SBY[2];BGXY;AMXY;BGZ;AMZ
JS#TUNE;ST_BY=1;EN
```

REM !!!! Flush/Fill Main Screen !!!!

```
#SOFL_MN
JS#FKEYREL
FNF_FLAG=0
JS#S006
AC 100000,100000,100000
DC 50000,50000,50000
SP 50000,50000,100000/SCALE_Z
JS#DR_CLOS;JS#SAFEZ;PA PT_APG[0],PT_APG[1],PT_APG[2];BGXY;AMXY
BGZ;AMZ;JS#H1DW;JS#H2DW;JS#H3DW
#SOFL_LP
JP#SOFLEND,@IN[FKEY1]=0
JP#SO_FLSH,@IN[FKEY3]=0
JP#MAT_FIL,@IN[FKEY4]=0
JP#SO_FNF,@IN[FKEY6]=0
IF (FNF_FLAG=1)
FNF_FLAG=0
ENDIF
```

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```
JP#SOFL_LP

#SOFLEND
JS#FKEYREL
JS#ALLUP
JP#CS_MN1

#SO_FLSH
JS#S007
JS#SOLV
WT1500
JS#H1DW;JS#H2DW;JS#H3DW
JS#H1VLON;JS#H2VLON;JS#H3VLON
TEMP_TM=TIME
#WT_FLSH
JP#ABRTSF,(((IN[FKEY1]=0)&(ACFLAG=0))
JP#WT_FLSH,((TIME-TEMP_TM)<FLUSH_TM)
#ABRTSF2
JS#H1VLOF;JS#H2VLOF;JS#H3VLOF
JS#S006,ACFLAG=0
JP#SOFL_LP,((FNF_FLAG=0)&(ACFLAG=0))

#MAT_FIL
JS#S008
JS#MATV
WT1500
JS#H1DW;JS#H2DW;JS#H3DW
JS#H1VLON;JS#H2VLON;JS#H3VLON
TEMP_TM=TIME
#WT_FIL
JP#ABRTMF,(((IN[FKEY1]=0)&(ACFLAG=0))
JP#WT_FIL,((TIME-TEMP_TM)<FILL_TM)
#ABRTMF2
JS#H1VLOF;JS#H2VLOF;JS#H3VLOF
JS#S006,ACFLAG=0
JS#FKEYREL
FNF_FLAG=0
JP#SOFL_LP,(ACFLAG=0)
EN

#ABRTSF
JP#ABRTSF,(@IN[FKEY1]=0)
FNF_FLAG=0
JP#ABRTSF2

#ABRTMF
JP#ABRTMF,(@IN[FKEY1]=0)
JP#ABRTMF2

#SO_FNF
FNF_FLAG=1
JP#SO_FLSH

#AC_FNF
```

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```

JP#AC_FNF,_XQ2>0
JS#ALLUP
JS#SAFEZ
AC 100000,100000,100000
DC 50000,50000,50000
SP 50000,50000,100000/SCALE_Z
JS#DR_CLOS;JS#SAFEZ;PA PT_APG[0],PT_APG[1],PT_APG[2];BGXY;AMXY
BGZ;AMZ;JS#H1DW;JS#H2DW;JS#H3DW

FNF_FLAG=0
IF (@OUT[0SOLV]=1)
  JS#SO_FLSH
ELSE
  JS#MAT_FIL
ENDIF
JS#S020
FLSO_TM=TIME
SOL_TM=TIME
JS#ALLUP
JS#SAFEZ
JS#MV_SBY
EN

REM !!!! Move To Solvent Cup Routine (Thread 1) !!!!
#MV_SOL;JS#DR_CLOS;SP 100000,100000,100000/SCALE_Z
AC 200000,200000,200000/SCALE_Z;DC 200000,200000,200000/SCALE_Z
SH,DELTAS=@ABS[_TPX-PT_SOL[0]]+@ABS[_TPY-PT_SOL[1]]+@ABS[_TPZ-PT_SOL[2]]
JS#S039,DELTAS>10,JS#SAFEZ,DELTAS>10
PA PT_SOL[0],PT_SOL[1],PT_SOL[2];BGXY;AMXY;BGZ;AMZ
JS#H1DW;JS#H2DW;JS#H3DW;JS#TUNE;ST_BY=0;EN

REM !!!! Cyclestop Routine (Thread 1) !!!!
#CS_MN;JP#CS_MN,FPOWER=0,JS#S002;JS#WAIT_FI,JS#MV_HOME
#CS_MN1,JS#ALLUP,JP#CS_MN1,FPOWER=0,JP#CS_MN,POS_VAL=0,JS#MV_SOL,SO_EN=1
JS#MV_SBY,SO_EN=0;CSTOP=0;ACFLAG=0

IF (SOLVENT=1)
  JS#SOLV
ELSE
  JS#MATV
ENDIF

WT400;JS#S003;JS#FKEYREL
#CS_LP;JP#PG_MN,@IN[FKEY1]=0
JP#SOFL_MN,@IN[FKEY2]=0
JP#CA_MN,@IN[FKEY3]=0
JP#MA_MN,@IN[FKEY4]=0;JP#AC_MN,@IN[FKEY5]=0;JP#ST_MN,@IN[FKEY6]=0
JP#SU_MN,@IN[FKEY8]=0
JS#CS_AP,(AP_TE*AP_OUT*(1-SO_EN))>AP_TIME;JP#CS_LP
#CS_AP;XQ#A PURGE,2
#CS_API;JP#CS_API,PING=1;JS#S003;EN

REM!!!! Program Selection (Thread 1) !!!!
#PG_MN;JS#S004

```

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```
#PG_MN1;JS#S005;JS#FKEYREL
#PG_LP;JP#PG_BV,@IN[FKEY1]=0
  JP#PG_DW,@IN[FKEY2]=0;JP#PG_UP,@IN[FKEY3]=0;JP#PG_LP
#PG_BV;JS#S100;JS#LPPROG;JS#FKEYREL;JP#CS_MN1
#PG_DW;CPROG=CPROG-1;JP#PG_MN1,CPROG>0;CPROG=KNPROG;JP#PG_MN1
#PG_UP;CPROG=CPROG+1;JP#PG_MN1,CPROG-1<KNPROG;CPROG=1;JP#PG_MN1
```

REM !!!! Teach Routines (Thread 1) !!!!

```
#TE_F2;KEY=22*TEACH;JP#TE_FA,RKEY=53;JP#TE_FA,(TIME-TETIME)>1000;JP#TE_F2
#TE_FA;JP#TE_FB,RKEY=53;KEY=0;RKEY=0;JS#FKEYREL;JS#TKEYREL;EN
#TE_FB;CB6;WT50;SB6;KEY=0;WT100;RKEY=0;JS#FKEYREL;JS#TKEYREL;EN
#TE_PB;HX2;HX3;ST;AM;JS#S076;KEY=44*TEACH;WT2000;KEY=0;JP#MA_MN1
#TE_RS;HX0;WT100;XQ#SCAN;0;JS#DR_CLOS;TEACH=0;KEY=0;PASSED=1
  SP 60000,60000,100000/SCALE_Z
  JP#TE_RS1,PMX>1;PAZ=0;BGZ;AMZ
#TE_RS1;CS;XQ#PROG,2;PLYBCK=0
#TE_RS2;JP#TE_RS2,_XQ2>0;ST;AM;JP#MA_MN1
```

REM !!!! Calibration Routine (Thread 1) !!!!

```
#CA_MN;JS#S009;JS#ALLUP;JS#FKEYREL
  SP 30000,30000,60000/SCALE_Z
  AC 100000,100000,100000/SCALE_Z
  DC 50000,50000,50000/SCALE_Z;JS#SAFEZ
  PA PT_CAL[0],PT_CAL[1],PT_CAL[2];BGXY;AMXY
  BGZ;AMZ;JS#H2DW;DRFLAG=0
#CA_LP;JP#CS_MN1,@IN[FKEY1]=0;JP#CA_HOME,@IN[FKEY3]=0;JP#CA_LP
#CA_HOME;JS#MV_HOME;JP#CA_MN
```

REM !!!! Manual Mode Functions (Thread 1) !!!!

```
#MA_MN
  JS#FKEYREL
REM !!!! Warn if Solvent in Lines !!!
  IF (@OUT[oSOLV]=0)
    JS#S013
    #SO WRN2
    JP#CS_MN1,@IN[FKEY1]=0
    JP#IGNWRN2,@IN[FKEY2]=0
    JP#SO_WRN2
    #IGNWRN2
    JS#FKEYREL
  ENDIF
  JS#MV_SBY
#MA_MN1;DRFLAG=0;CTM=0;TEACH=1;KEY=0;PLYBCK=0;RKEY=0
  CAXIS=1;JS#S010;JS#FKEYREL;HX2;XQ#TB_XY,2;MODE=1
#MA_LP;JP#MA_END,@IN[FKEY1]=0;TETIME=TIME;JS#TE_F2,@IN[FKEY2]=0
  JS#VV_MN,@IN[FKEY3]=0;JP#OS_MN,@IN[FKEY4]=0;JS#PR_MN,@IN[FKEY5]=0
  JS#TP_MN,@IN[FKEY6]=0;JS#AX_MN,@IN[FKEY8]=0;JP#TE_PB,PLYBCK=1
  JS#RM_TCH,(@IN[iTEACH]+@IN[iPURGE]+@IN[iAXIS])<3;JP#MA_LP
#MA_END;JS#LED_RS;TEACH=0;JS#FKEYREL;HX2;ST;AM;VLV=VSTORE
  MODE=0;JS#DR_CLOS;JS#ALLUP;JP#CS_MN1
```

REM !!!! Valve Function Routines (Thread 1) !!!!

```
#VV_MN;JS#S016;JS#FKEYREL;MODE=3
#VV_LP;JP#VV_END,@IN[FKEY1]=0;JS#PR_MN,@IN[FKEY2]=0;JS#VV_SEL,@IN[FKEY3]=0
```

```
JS#VV_UP,@IN[FKEY4]=0;JS#VV_DW,@IN[FKEY5]=0;JS#VV_RA,@IN[FKEY6]=0
JS#VV_RB,@IN[FKEY7]=0;JP#NOOP,PLYBCK=1
JS#RM_TCH,(@IN[iTEACH]+@IN[iPURGE]+@IN[iAXIS])<3;JP#VV_LP
#VV_END;JS#S010;JS#FKEYREL;MODE=1;EN
#VV_SEL;CHEAD=CHEAD+1;JP#VV_SEL1,CHEAD-1<KNHEAD;CHEAD=1
#VV_SEL1;JS#FKEYREL;JS#S012;JS#S017;EN
#VV_UP;JS#H1UP,CHEAD=1;JS#H2UP,CHEAD=2;JS#H3UP,CHEAD=3;JS#FKEYREL;EN
#VV_DW;JS#H1DW,CHEAD=1;JS#H2DW,CHEAD=2;JS#H3DW,CHEAD=3;JS#FKEYREL;EN
#VV_RA;JS#H1RA,CHEAD=1;JS#H2RA,CHEAD=2;JS#H3RA,CHEAD=3;JS#FKEYREL;EN
#VV_RB;JS#H1RB,CHEAD=1;JS#H2RB,CHEAD=2;JS#H3RB,CHEAD=3;JS#FKEYREL;EN
```

REM !!!! One-Shot Routine (Thread 1) !!!!

```
#OS_MN;ST;AM;HX2;TEACH=0;WT200;ACFLAG=1;JS#MV_SBY;ACFLAG=0;DRFLAG=0
JS#LPPROG;JS#S022;CTM=0;JS#FKEYREL
#OS_LP;JP#MA_MN,@IN[FKEY1]=0;JP#OS_RUNW,@IN[FKEY2]=0
JP#OS_RUND,@IN[FKEY3]=0;JP#OS_LP
#OS_RUN;JS#AC_LL,VLV=1;JS#DR_CLOS;CTM=0;JS#S021
JS#FKEYREL;CS;CTM=TIME;XQ#PROG,2
#OS_RUN1;JP#OS_RUN1,_XQ2>0;ACFLAG=1;JS#MV_SBY;ACFLAG=0;CTM=TIME-CTM
#OS_RUN2;CCNT=CCNT+1;JP#OS_MN
#OS_RUNW;VLV=1;JP#OS_RUN
#OS_RUND;VLV=0;JP#OS_RUN
```

REM !!!! Manual Purge (Thread 1) !!!!

```
#PR_MN;VLV=1;JS#H1VLON,CHEAD=1;JS#H2VLON,CHEAD=2;JS#H3VLON,CHEAD=3
JS#FKEYREL;JS#TKEYREL;JS#H1VLOF,CHEAD=1;JS#H2VLOF,CHEAD=2;JS#H3VLOF,CHEAD=3;EN
```

REM !!!! Tell Position Routine (Thread 1) !!!!

```
#TP_MN;JS#CLS;JS#S041;JS#FKEYREL;JS#S010;EN
```

REM !!!! Select Axis Routines (Thread 1) !!!!

```
#AX_MN;JS#S015;JS#FKEYREL;MODE=2
#AX_LP;JP#AX_END,@IN[FKEY1]=0;TETIME=TIME;JS#TE_F2,@IN[FKEY2]=0
JS#PR_MN,@IN[FKEY3]=0;JS#AX_XY,@IN[FKEY4]=0;JS#AX_X,@IN[FKEY5]=0
JS#AX_Y,@IN[FKEY6]=0;JS#AX_Z,@IN[FKEY7]=0;JP#NOOP,PLYBCK=1
JS#RM_TCH,(@IN[iTEACH]+@IN[iPURGE]+@IN[iAXIS])<3;JP#AX_LP
#AX_END;JS#FKEYREL;JS#S010;MODE=1;EN
#AX_XY;CAXIS=1;JS#AX_SCR;JS#LED_XY;SX=FSTX;SY=FSTY;SZ=0;JP#AX_DN
#AX_X;CAXIS=2;JS#AX_SCR;JS#LED_X;SY=0;SX=FSTX;SZ=0;JP#AX_DN
#AX_Y;CAXIS=3;JS#AX_SCR;JS#LED_Y;SX=0;SY=FSTY;SZ=0;JP#AX_DN
#AX_Z;CAXIS=4;JS#AX_SCR;JS#LED_Z;SX=0;SY=0;SZ=FSTZ;JP#AX_DN
#AX_SCR;JS#S011;MODE=2;JS#S011B;MODE=1;EN
#AX_DN;JS#FKEYREL;JS#TKEYREL;EN
```

REM !!!! Auto Cycle Routines (Thread 1) !!!!

```
#AC_MN
JS#FKEYREL
JS#AC_LL,VLV=1
REM !!!! Warn if Solvent in Lines !!!
IF (@OUT[oSOLV]=0)
JS#S013
#SO_WRN
JP#CS_MN1,@IN[FKEY1]=0
JP#IGN_WRN,@IN[FKEY2]=0
```

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```

JP#SO_WRN
#IGN_WRN
ENDIF
JS#FKEYREL
ACFLAG=1
JS#LPPROG;CTM=0;JS#A_PURGE,SO_EN=1
JP#AC_MN1,@IN[iSTART]=1;FLSO_TM=TIME;JS#S045
#AC_MNX;JP#AC_MNX,@IN[iSTART]=0
#AC_MN1;SOL_TM=TIME;JS#S020;JS#FKEYREL
#AC_LP
JP#AC_END,@IN[FKEY1]=0
JS#AC_LL,VLV=1
JS#AC_DR,_XQ2<0
JS#AC_SO,((TIME-SOL_TM)*ST_BY*SO_EN)>SLP_TM
JP#AC_S,@IN[iSTART]=0
JS#AC_AP,(AP_TE*AP_OUT*(1-SO_EN))>AP_TIME
JS#AC_FNF,(((TIME-FLSO_TM)*FNF_EN)>FNF_TM)
JP#AC_LP
#AC_END;JP#AC_END,PING=1;JS#S100;ACFLAG=0;JP#CS_MN1
#AC_S;JP#AC_S1,ST_BY=1,XQ#A_PURGE,2
#AC_S1;JS#DR_CLOS,JP#AC_S1,PING=1;CTM=0;CS;JS#S021;JS#FKEYREL
CTM=TIME;XQ#PROG.2
#AC_2;JP#AC_2,_XQ2>0;JP#AC_2,@IN[iSTART]=0
CCNT=CCNT+1;JS#MV_SBY;CTM=TIME-CTM;DRFLAG=0;JP#AC_MN1
#AC_AP;JP#NOOP,PING=1;JS#A_PURGE;JS#S020;EN
#AC_DR;DRFLAG=0;EN
#AC_LL;LL_VAR=14;JP#AC_LLE,@IN[iLEVELA]&LLA_EN=1;LL_VAR=39
JP#AC_LLE,@IN[iLEVELB]&LLB_EN=1;EN
#AC_LLE;LL_ERR=LL_VAR,WT999;EN

```

REM !!!! Move to Solvent Cups !!!!

```
#AC_SO;JS#ALLUP;JP#AC_SO,_XQ2>0;JS#MV_SOL;JS#S020;EN
```

REM !!!! Status Routines (Thread 1) !!!!

```

#ST_MN;JS#S024
#ST_LP;JP#ST_END,@IN[FKEY1]=0;JP#ST_SS,@IN[FKEY3]=0;JP#ST_LP
#ST_END;JP#CS_MN1
#ST_SS;JS#SS_MN;JP#ST_MN

```

REM !!!! Setup Routines (Thread 1) !!!!

```

#SU_MN;JS#S030;JS#SU_SCR
#SU_LP;JP#SU_END,@IN[FKEY1]=0
JP#SU_CNT,@IN[FKEY2]=0;JP#SU_CRS,@IN[FKEY3]=0
JP#SFMF_SU,@IN[FKEY4]=0
JS#SU_APON,@IN[FKEY5]=0;JS#SU_APOF,@IN[FKEY6]=0
JS#SU_WET,@IN[FKEY7]=0;JS#SU_DRY,@IN[FKEY8]=0;JP#SU_LP
#SU_END;JS#FKEYREL;JS#S100;VLV=VSTORE;JP#CS_MN1
#SU_CNT;JS#S031;JS#FKEYREL;JP#SU_MN
#SU_CRS;CCNT=0;JS#S100;JP#SU_MN
#SU_APON;AP_EN=1;JP#SU_SCR
#SU_APOF;AP_EN=0;JP#SU_SCR
#SU_WET;VSTORE=1;JP#SU_SCR
#SU_DRY;VSTORE=0
#SU_SCR;JS#FKEYREL;LCD1=AP_EN;LCD3=VSTORE;JS#S025;EN

```

REM !!!! Solvent Flush/Material Fill Setup Options !!!!

#SFMF_SU

JS#FKEYREL

JS#S0301

JS#S0301A

JS#S0301B

#SFMF_LP

JP#SFMFEND,(@IN[FKEY1]=0)

JP#ACSF_MN,(@IN[FKEY3]=0)

JS#SF_UP,(@IN[FKEY5]=0)

JS#SF_DW,(@IN[FKEY6]=0)

JS#MF_UP,(@IN[FKEY7]=0)

JS#MF_DW,(@IN[FKEY8]=0)

JP#SFMF_LP

EN

#SF_UP

STP_TM=TIME;STEP=1000

#SF_UP1

FLUSH_TM=FLUSH_TM+STEP;JS#SF_RS1,FLUSH_TM>MAX_FLSH;JS#S0301A;WT75

JS#STEP_C,(TIME-STP_TM)>2500;JP#SF_UP1,@IN[FKEY5]=0

EN

#SF_DW

STP_TM=TIME;STEP=1000

#SF_DW1

FLUSH_TM=FLUSH_TM-STEP;JS#SF_RS0,FLUSH_TM<MIN_FLSH;JS#S0301A;WT75

JS#STEP_C,(TIME-STP_TM)>2500;JP#SF_DW1,@IN[FKEY6]=0

EN

#MF_UP

STP_TM=TIME;STEP=1000

#MF_UP1

FILL_TM=FILL_TM+STEP;JS#MF_RS1,FILL_TM>MAX_FILL;JS#S0301B;WT75

JS#STEP_C,(TIME-STP_TM)>2500;JP#MF_UP1,@IN[FKEY6]=0

EN

#MF_DW

STP_TM=TIME;STEP=1000

#MF_DW1

FILL_TM=FILL_TM-STEP;JS#MF_RS0,FILL_TM<MIN_FILL;JS#S0301B;WT75

JS#STEP_C,(TIME-STP_TM)>2500;JP#MF_DW1,@IN[FKEY7]=0

EN

#SFMFEND

JP#SFMFEND,@IN[FKEY1]=0

JP#SU_MN

#S0301;JS#CLS

JS#L1;MG{P2}{N}"F&F: AUTO Flsh s. Fil s."

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JS#L2;MG{P2}{N}"EXIT OPT UP DW UP DW ";EN

#S0301A;MG{P2}{N}{^17},{^25},{^150},{^18},{FLUSH_TM/1000}{F3.0};EN
#S0301B;MG{P2}{N}{^17},{^25},{^161},{^18},{FILL_TM/1000}{F3.0};EN

#SF_RS1;FLUSH_TM=MIN_FLSH;STP_TM=TIME;EN
#SF_RS0;FLUSH_TM=MAX_FLSH;STP_TM=TIME;EN
#MF_RS1;FILL_TM=MIN_FILL;STP_TM=TIME;EN
#MF_RS0;FILL_TM=MAX_FILL;STP_TM=TIME;EN
#STEP_C;STEP=STEP*5;STP_TM=TIME;EN
#STEP_D;STEP=STEP*10;STP_TM=TIME;EN

REM !!!!Auto Cycle Solvent Flush Options!!!

#ACSF_MN
JS#FKEYREL
JS#S0302
JS#S0302A
JS#S0302B
#ACSF_LP
JP#SFMF_SU,(@IN[FKEY1]=0)
JS#FNF_ON,@IN[FKEY3]=0
JS#FNF_OF,@IN[FKEY4]=0
JS#FNF_UP,(@IN[FKEY5]=0)
JS#FNF_DW,(@IN[FKEY6]=0)
JP#ACSF_LP

#FNF_UP
STP_TM=TIME;STEP=60000
#FNF_UP1
FNF_TM=FNF_TM+STEP;JS#FNF_RS1,FNF_TM>MAX_FNF;JS#S0302A;WT75
JS#STEP_D,(TIME-STP_TM)>2500;JP#FNF_UP1,@IN[FKEY5]=0
EN

#FNF_DW
STP_TM=TIME;STEP=60000
#FNF_DW1
FNF_TM=FNF_TM-STEP;JS#FNF_RS0,FNF_TM<MIN_FNF;JS#S0302A;WT75
JS#STEP_D,(TIME-STP_TM)>2500;JP#FNF_DW1,@IN[FKEY6]=0
EN

#S0302;JS#CLS
JS#L1;MG{P2}{N}"Auto Opt: F&F Freq min "
JS#L2;MG{P2}{N}"EXIT ON OFF UP DW ";EN

#S0302A
MG{P2}{N}{^17},{^25},{^151},{^18},{FNF_TM/60000}{F3.0}
EN

#S0302B
MG{P2}{N}{^17},{^25},{^202},{^18},ASTRSK[FNF_EN]{S}
MG{P2}{N}{^17},{^25},{^206},{^18},ASTRSK[FNF_EN+2]{S};EN

#FNF_ON;FNF_EN=1;JS#S0302B;JS#FKEYREL;EN

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```
#FNF_OF;FNF_EN=0;JS#S0302B;JS#FKEYREL;EN
#FNF_RS1;FNF_TM=MIN_FNF;STP_TM=TIME;EN
#FNF_RS0;FNF_TM=MAX_FNF;STP_TM=TIME;EN
```

REM !!!! Auto Purge (Thread 2) !!!!

```
#A_PURGE
AP_OUT=0;PING=1;VLV=1;JS#S040
AC 100000,100000,100000
DC 50000,50000,50000
SP 50000,50000,100000/SCALE_Z
JS#DR_CLOS;JS#SAFEZ;PA PT_APG[0],PT_APG[1],PT_APG[2];BGXY;AMXY
BGZ;AMZ;JS#H1DW;JS#H2DW;JS#H3DW;JS#H1VLON;JS#H2VLON;JS#H3VLON;WT AP_LEN
JS#H1VLOF;JS#H2VLOF;JS#H3VLOF;JS#H1UP;JS#H2UP;JS#H3UP;WT200
JS#MV_SBY;AP_TE=0;AP_TP=TIME;VLV=VSTORE
PING=0;AP_OUT=1;EN
```

REM !!!! Trackball (Thread 2) !!!!

```
#TB_XY;ST;AM
DC 125000,125000,960000/SCALE_Z
AC 125000,125000,425000/SCALE_Z;JS#LED_XY
SX=FSTX;SY=FSTY;SZ=0;DE*=0;MX=0;MY=0;MZ=0;MXL=0
MYL=0;MZL=0;MT=TIME;DE MXL,MYL,MZL;MTL=MT;SH;JG 0,0,0;BGXYZ
#TB_XY1;DT=MT-MTL;MTL=MT;MT=TIME;MXL=MX;MYL=MY;MZL=MZ
MZ=DEX;MX=DEX;MY=DEY;MDT=MT-MTL;VELX=SX*(MX-MXL)/MDT
VELY=SY*(MY-MYL)/MDT;VELZ=SZ*(MZL-MZ)/MDT;JP#MCHKZP,CAXIS=4
#MCHKXP;JP#MCHKXN,VELX<0;JP#MCHKYP,TPX+1000<_FLX;VELX=0;JP#MCHKYP
#MCHKXN;JP#MCHKYP,TPX-1000>_BLX;VELX=0
#MCHKYP;JP#MCHKYN,VELY<0;JP#TB_XY2,TPY+1000<_FLY;VELY=0;JP#TB_XY2
#MCHKYN;JP#TB_XY2,TPY-1000>_BLY;VELY=0;JP#TB_XY2
#MCHKZP;JP#MCHKZN,VELZ<0;JP#TB_XY2,TPZ+1000<_FLZ;VELZ=0;JP#TB_XY2
#MCHKZN;JP#TB_XY2,TPZ-1000>_BLZ;VELZ=0
#TB_XY2;JG VELX,VELY,VELZ;JP#TB_XY1
```

REM !!!! Teach Pendant Routines (Thread 1) !!!!

```
#RM_TCH;JS#RM_AX,@IN[iAXIS]=0;JS#PR_MN,@IN[iPURGE]=0
TETIME=TIME;JS#TE_F2,@IN[iTEACH]=0;EN
#RM_AX;CAXIS=CAXIS+1;JS#RM_AR,CAXIS>4;JS#AX_XY,CAXIS=1
JS#AX_X,CAXIS=2;JS#AX_Y,CAXIS=3;JS#AX_Z,CAXIS=4;EN
#RM_AR;CAXIS=1;EN
#LED_XY;SB3;SB4;CB1;CB2;EN
#LED_X;SB2;SB3;SB4;CB1;EN
#LED_Y;SB1;SB3;SB4;CB2;EN
#LED_Z;SB1;SB2;SB4;CB3;EN
#LED_W;SB1;SB2;SB3;CB4;EN
#LED_RS;SB1;SB2;SB3;SB4;SB6;EN
```

REM !!!! LCD Screens !!!!

```
#INITLCD;CC 9600,0,0,0;WT500;JS#CLS;EN

#CLS;MG{P2}{N}{^17},{^12},{^01},{^02},{^18};EN

#L1;MG{P2}{N}{^17},{^25},{^128},{^18};EN

#L2;MG{P2}{N}{^17},{^25},{^192},{^18};EN
```

```
#S001;JS#CLS
JS#L1;MG{P2}{N}"Precision Valve & Automation";MG{P2}{N}" Inc"
JS#L2;MG{P2}{N}"System Initialization, please ";MG{P2}{N}"wait... ";EN

#S002;JS#CLS;JS#L1;MG{P2}{N}"Press F1 to home the system. ";EN

#S003;JS#CLS
JS#L1;MG{P2}{N}"Cycle Stop ";MG{P2}{N}" "
JS#L2;MG{P2}{N}"PROG F&F CAL MAN AUTO STAT";MG{P2}{N}" SETUP";EN

#S004;JS#CLS
JS#L1;MG{P2}{N}"Select Program: ",A_PROGA[CPROG]{S},A_PROGB[CPROG]{S}
JS#L2;MG{P2}{N}"EXIT PREV NEXT";EN

#S005
MG{P2}{N}{^17},{^25},{^144},{^18},A_PROGA[CPROG]{S},A_PROGB[CPROG]{S};EN

#S006;JS#CLS
JS#L1;MG{P2}{N}" SOLV MAT ";MG{P2}{N}"FLSH& "
JS#L2;MG{P2}{N}"EXIT FLSH FILL ";MG{P2}{N}"FILL ";EN

#S007;JS#CLS
JS#L1;MG{P2}{N}"Solvent Flush in Progress... ";MG{P2}{N}" "
JP#NOOP,(ACFLAG=1)
JS#L2;MG{P2}{N}"EXIT ";MG{P2}{N}" ";EN

#S008;JS#CLS
JS#L1;MG{P2}{N}"Material Fill in Progress... ";MG{P2}{N}" "
JP#NOOP,(ACFLAG=1)
JS#L2;MG{P2}{N}"EXIT ";MG{P2}{N}" ";EN

#S009;JS#CLS;JS#L1;MG{P2}{N}"Calibration"
JS#L2;MG{P2}{N}"EXIT HOME ";MG{P2}{N}" ";EN

#S010;JS#CLS;JS#L1;MG{P2}{N}"Jog Mode Head: ",A_HEAD[CHEAD]{S}
MG{P2}{N}A2HEAD[CHEAD]{S}," Axis: ",AXIS[CAXIS]{S}
JS#L2;MG{P2}{N}"EXIT TEACH VLV RUN PURG TP ";MG{P2}{N}" AXIS";EN

#S011;MG {P2}{N}{^17},{^25},{^157},{^18},AXIS[CAXIS]{S};EN

#S011B;MG {P2}{N}{^17},{^25},{^164},{^18},AXIS[CAXIS]{S};EN

#S012;MG {P2}{N}{^17},{^25},{^153},{^18},A_HEAD[CHEAD]{S},A2HEAD[CHEAD]{S};EN

#S013;JS#CLS
JS#L1;MG{P2}{N}"Warning! Solvent not been";MG{P2}{N}" flushed! "
JS#L2;MG{P2}{N}"EXIT CONT ";MG{P2}{N}" ";EN

#S015;JS#CLS
JS#L1;MG{P2}{N}"Trackball Control Current: ",AXIS[CAXIS]{S}
JS#L2;MG{P2}{N}"EXIT TEACH PURG X&Y X Y ";MG{P2}{N}" Z ";EN

#S016;JS#CLS;JS#L1;MG{P2}{N}"Valve Functions Head: "
```

```
MG{P2}{N} A_HEAD[CHEAD]{S},A2HEAD[CHEAD]{S}
JS#L2;MG{P2}{N}"EXIT PURG SEL UP DOWN ";MG{P2}{N}"

#S017;JP#OPT3,R_HEAD[CHEAD]=1
MG{P2}{N}{^17},{^25},{^218},{^18}," ";EN

#OPT3;MG{P2}{N}{^17},{^25},{^218},{^18},"ROTA ROTB";EN

#S019;JS#CLS;JS#L1;MG{P2}{N}"Homing axes. Please wait... ";EN

#S020;JS#CLS;JP#OPT1,VLV=0
JS#L1;MG{P2}{N}"Auto Cycle WET Count:",{F8.0}CCNT;JP#OPT2

#OPT1;JS#L1;MG{P2}{N}"Auto Cycle DRY Count:",{F8.0}CCNT

#OPT2;JS#L2;MG{P2}{N}"STOP "
MG{P2}{N} A_PROGA[CPROG]{S},A_PROGB[CPROG]{S};JP#NOOP,AC_TMR=0
JP#NOOP,CTM=0;MG{P2}{N}"",{F3.1}CTM*0.9766/1000," Sec.";EN

#S021;JS#CLS
JS#L1;MG{P2}{N}"In Cycle... Count:",{F8.0}CCNT;JP#OPT2

#S022;JS#CLS
JS#L1;MG{P2}{N}"Press F2 or F3 to run",MG{P2}{N}" 1 cycle. "
JS#L2;MG{P2}{N}"EXIT WET DRY ",A_PROGA[CPROG]{S},A_PROGB[CPROG]{S}
JP#NOOP,AC_TMR=0,JP#NOOP,CTM=0;MG{P2}{N}"",{F3.1}CTM*0.9766/1000," Sec.";EN

#S024;JS#CLS;JS#L1;MG{P2}{N}"Status"
JS#L2;MG{P2}{N}"EXIT STAT ",MG{P2}{N}" ";EN

#S025;LCD2=LCD1+2;LCD4=LCD3+2
MG{P2}{N}{^17},{^25},{^213},{^18},ASTRSK[LCD1]{S}
MG{P2}{N}{^17},{^25},{^218},{^18},ASTRSK[LCD2]{S}
MG{P2}{N}{^17},{^25},{^223},{^18},ASTRSK[LCD3]{S}
MG{P2}{N}{^17},{^25},{^228},{^18},ASTRSK[LCD4]{S};EN

#S030;JS#CLS
JS#L1;MG{P2}{N}"Setup Counter F&F Auto Purg";MG{P2}{N}"e Run Mode"
JS#L2;MG{P2}{N}"EXIT CNT RES OPT ON OFF";MG{P2}{N}" WET DRY";EN

#S031;JS#CLS;JS#L1;MG{P2}{N}"Count:",{F8.0}CCNT;EN

#S039;JS#CLS;JS#L1;MG{P2}{N}"Moving to Solvent!!!";EN

#S040;JS#CLS;JS#L1;MG{P2}{N}"AUTO PURGE!!!";EN

#S041;JS#CLS;JS#L1;MG{P2}{N}"Current Position: "
JS#L2;MG{P2}{N}"X",_TPX{F6.0},"Y",_TPY,"Z",_TPZ;EN

#S045;JS#CLS;JS#L1;MG{P2}{N}"Start switches activated!"
JS#L2;MG{P2}{N}"Deactivate to continue the pro";MG{P2}{N}"gram. ";EN

#S076;JS#CLS;JS#L1;MG{P2}{N}"Waiting for path...";EN
```

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512VA-1209

#S100;JS#CLS
JS#L1;MG{P2}{N}"Saving data...please wait.";WT150;BV;JS#FKEYREL;EN

#S159;JS#CLS
JS#L1;MG{P2}{N}"Checking for exhaust input. Ple";MG{P2}{N}"ase wait.";EN

#S160;JS#CLS
JS#L1;MG{P2}{N}"Verifying exhaust. Please wait.";MG{P2}{N}";EN

#S161;JS#L2;MG{P2}{N}"",{F3.0}{FAN_WT/1000};EN

#S198;JS#CLS;JS#L1;MG{P2}{N}ECOD1[MEC]{S},ECOD2[MEC]{S}
MG{P2}{N}ECOD3[MEC]{S},ECOD4[MEC]{S},ECOD5[MEC]{S}
JS#L2;MG{P2}{N}"Press F1 to continue the progr";MG{P2}{N}"am.";MERR=MEC
JS#WAIT_F1;JS#FAN_WT;JP#ESTOP1

#S199;JP#ESTOP1,MERR=MEC;JS#CLS
JS#L1;MG{P2}{N}OPF1[PNEC]{S},OPF2[PNEC]{S},OPF3[PNEC]{S},OPF4[PNEC]{S}
MG{P2}{N}" failure.";JS#L2;MG{P2}{N}"Repair and press F1."
MERR=MEC;JS#WAIT_F1;JS#FKEYREL,VPNT0=0;PNEC=0;JP#ESTOP1

#S200;JP#ESTOP1,MERR=MEC;JS#CLS;JS#L1;MG{P2}{N}ECOD1[MEC]{S},ECOD2[MEC]{S}
MG{P2}{N}ECOD3[MEC]{S},ECOD4[MEC]{S},ECOD5[MEC]{S}
JS#L2;MG{P2}{N}"to continue the program.";MERR=MEC;JP#ESTOP1

#S201;JS#CLS;JS#L1;MG{P2}{N}"Error",{F3.0}ERR," on line",{F4.0}LINE,"."
JS#L2;MG{P2}{N}"Press F1 to restart, F5 for st";MG{P2}{N}"atus. ",EN

#S202;JS#CLS
JS#L1;MG{P2}{N}"Position Error. F1-restart, F5-";MG{P2}{N}"status. "
JS#L2;MG{P2}{N}"Stop codes (x,y,z",{F3.0}_SCX,"",{F3.0}_SCY,""
MG{P2}{N}{F3.0}_SCZ;EN

#S203;JS#CLS
JS#L1;MG{P2}{N}"Limit Error. F1-restart, F5-sta";MG{P2}{N}"tus. "
JS#L2;MG{P2}{N}"Stop codes (x,y,z",{F3.0}_SCX,"",{F3.0}_SCY,""
MG{P2}{N}{F3.0}_SCZ;EN

#S204;JS#CLS;JS#L1;MG{P2}{N}"Variable error."
JS#L2;MG{P2}{N}"Initializing...";EN

#S205;JS#CLS
JS#L1;MG{P2}{N}"Unrecoverable variable error d";MG{P2}{N}"uring "
JS#L2;MG{P2}{N}"startup. Restart the machine.";HX

#S206;JS#CLS
JS#L1;MG{P2}{N}"Subroutine error. The subrout";MG{P2}{N}"ine is not"
JS#L2;MG{P2}{N}"stored in segment 1, 2 or 3.";EN

#S208;JP#ESTOP1,MERR=MEC;MERR=MEC;JS#CLS
JS#L1;MG{P2}{N}"Press F1 to return head to sta";MG{P2}{N}"ndby."
JS#L2;MG{P2}{N}" OK";JP#ESTOP1

#S209;JS#CLS;JS#L1;MG{P2}{N}"Press F1 to restart.";JS#L2;MG{P2}{N}" OK";EN

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```
#S210;JP#ESTOP1,MERR=MEC;JS#CLS;JS#L1;MG{P2}{N}ECOD1[MEC]{S},ECOD2[MEC]{S}  
MG{P2}{N}ECOD3[MEC]{S},ECOD4[MEC]{S},ECOD5[MEC]{S};MERR=MEC  
JS#L2;MG{P2}{N}"Press F1 to continue.";JS#WAIT_F1;LL_ERR=0;JP#ESTOP1  
  
REM !!!! Error-Checking Subroutines !!!!  
#WAIT_F1;JP#WAIT_F1,@IN[80]=1;JS#FKEYREL;EN  
  
#FKEYREL;VRESUME=@IN[73]&@IN[74]&@IN[75]&@IN[76]  
VRESUME=VRESUME&@IN[77]&@IN[78]&@IN[79]&@IN[80]  
JP#FKEYREL,VRESUME=0;WT50;EN  
  
#TKEYREL;VRESUME=@IN[iTEACH]&@IN[iPURGE]&@IN[iAXIS]  
JP#TKEYREL,VRESUME=0;WT50;EN  
  
#S_ONE;JP#S_ONE,@IN[CKSEN]=0;EN  
  
#S_ZERO;JP#S_ZERO,@IN[CKSEN]=1;EN  
  
#OPTO;TSTART=TIME  
  
#OPTO2;JP#NOOP,@IN[SENINP]=ZORO;JP#OPTO2,(TIME-TSTART)<PNT0;VPNT0=1;WT999;EN  
  
#DR_CLOS;JP#DR_SHUT,@IN[iDOOR]=1;JS#CLS;JS#L1  
MG{P2}{N}"Close door to continue."  
  
#DR_CLO1;JP#DR_CLO1,@IN[iDOOR]<>1  
  
#DR_SHUT;DRFLAG=1;JP#NOOP,TEACH=0;JS#CLS;JS#L1;MG{P2}{N}"Cycle in progress.";EN  
  
#SAFEZ;PAZ=0;BGZ;AMZ;JS#ALLUP,SO_EN=1;EN  
  
REM !!!! Group Subroutines !!!!  
#ALLUP;JS#H1UP;JS#H2UP;JS#H3UP;JS#H1RA;JS#H2RA;JS#H3RA;EN  
  
REM !!!! Variable Assignments !!!!  
#GETASN;NA=0  
  
REM -----  
REM !! Inputs !!  
REM -----  
  
iESTOP=1;iSTART=2;iDOOR=3;iBYPASS=4;iPOWER=5  
iLEVELA=49;iLEVELB=67  
iAXIS=22;iPURGE=23;iTEACH=24  
FKEY1=80;FKEY2=79;FKEY3=78;FKEY4=77;FKEY5=76;FKEY6=75;FKEY7=74;FKEY8=73  
iFLOW=64  
  
iH1Z=53  
  
iH2Z=54  
iH2RB=55  
iH2RA=56
```

REM -----
REM !! Outputs !!
REM -----

oH1Z=25
oH1V=27
oH1AT=26

oH2Z=28
oH2V=31
oH2RB=29
oH2RA=30

oSOLV=32
oMATV=33

OPF1[1]="";OPF2[1]="";OPF3[1]="";OPF4[1]=""
OPF1[2]="";OPF2[2]="";OPF3[2]="";OPF4[2]=""
OPF1[3]="";OPF2[3]="";OPF3[3]="";OPF4[3]=""
OPF1[4]="";OPF2[4]="";OPF3[4]="";OPF4[4]=""
OPF1[5]="Spray";OPF2[5]=" Z-";OPF3[5]="slide ";OPF4[5]="UP"
OPF1[6]="Spray";OPF2[6]=" Z-";OPF3[6]="slide ";OPF4[6]="DOWN"
OPF1[7]="Dispen";OPF2[7]="se Z-";OPF3[7]="slide ";OPF4[7]="UP"
OPF1[8]="Dispen";OPF2[8]="se Z-";OPF3[8]="slide ";OPF4[8]="DOWN"
OPF1[9]="HD3";OPF2[9]=" Z-";OPF3[9]="slide ";OPF4[9]="UP"
OPF1[10]="HD3";OPF2[10]=" Z-";OPF3[10]="slide ";OPF4[10]="DOWN"
OPF1[11]="Spray";OPF2[11]=" r";OPF3[11]="otary";OPF4[11]="0 deg"
OPF1[12]="Spray";OPF2[12]=" r";OPF3[12]="otary ";OPF4[12]="45 deg"
OPF1[13]="Dispen";OPF2[13]="se r";OPF3[13]="otary ";OPF4[13]="0 deg"
OPF1[14]="Dispen";OPF2[14]="se r";OPF3[14]="otary ";OPF4[14]="45 deg"
OPF1[15]="HD3";OPF2[15]=" r";OPF3[15]="otary ";OPF4[15]="0 deg"
OPF1[16]="HD3";OPF2[16]=" r";OPF3[16]="otary ";OPF4[16]="45 deg"

ECOD1[1]="Emerge";ECOD2[1]="ncy St";ECOD3[1]="op. Re";ECOD4[1]="set bu"
ECOD5[1]="tton";ECOD1[2]="Left ";ECOD2[2]="Door ";ECOD3[2]="open. "
ECOD4[2]="Close";ECOD5[2]="";ECOD1[3]="";ECOD2[3]="Door "
ECOD3[3]="open. ";ECOD4[3]="Close";ECOD5[3]="";ECOD1[4]="Materi"
ECOD2[4]="al A L";ECOD3[4]="evel l";ECOD4[4]="ow. ";ECOD5[4]=""
ECOD1[5]="Materi";ECOD2[5]="al B L";ECOD3[5]="evel l"
ECOD4[5]="ow. ";ECOD5[5]="";ECOD1[6]="Exhaus";ECOD2[6]="t Flow"
ECOD3[6]=" low. ";ECOD4[6]="";ECOD5[6]="";EN

REM !!!! Machine-Specific Information !!!!
#IMACH;MT 1,1,1;CE 0,0,0
FSTX=20000;SLWX=10000
FSTY=20000;SLWY=10000
FSTZ=10000;SLWZ=5000

KNHEAD=2
A_HEAD[1]="Spray ";A2HEAD[1]=" ";R_HEAD[1]=0
A_HEAD[2]="Dispen";A2HEAD[2]="se ";R_HEAD[2]=1
A_HEAD[3]="HD3";A2HEAD[3]=" ";R_HEAD[3]=1

REM !!! Added Y offset to Home Routine !!!

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XOFF=0
YOFF=703
ZOFF=0

PT_APG[0]=69136;PT_APG[1]=54383;PT_APG[2]=10481
PT_CAL[0]=6660;PT_CAL[1]=41194;PT_CAL[2]=13921
PT_SBY[0]=33500;PT_SBY[1]=36600;PT_SBY[2]=250
PT_SOL[0]=70850;PT_SOL[1]=27679;PT_SOL[2]=9000

AP_EN=0;AP_LEN=2000;AP_TIME=30000;SLP_TM=30000;SO_EN=1
PNT0=4000;AC_TMR=1;LLA_EN=0;LLB_EN=0;XFL_EN=0

MIN_FLSH=0
MIN_FILL=0
MAX_FLSH=150000
MAX_FILL=150000
MIN_FNF=0
MAX_FNF=18000000

#TUNE;WT100
AC 150000,150000,150000/SCALE_Z
DC 150000,150000,150000/SCALE_Z
SP 60000,60000,100000/SCALE_Z
VA 70000,70000,70000
VD 70000,70000,70000
BL -4000,-2500,-1500
FL 71000,70500,16600
TL 9.9999,9.9999,9.9999
KD 67.99,82.43,305.75
KP 5.66,6.75,199.94
KI 0.25,0.19,0.34;EN

#SCALE;SCALE_Z=10;MO;SF 1,1,SCALE_Z;EN

REM !!!! Pneumatic and Dispensing Subroutines !!!!
#H1VLON;JP#NOOP,VLV=0;CB oH1AT;WT250;CB oH1V;AP_TP=TIME;EN
#H1VLOF;JS#APRS,@OUT[oH1V]=0;SB oH1V;WT50;SB oH1AT;EN
#H1UP;PNEC=5;SENINP=iH1Z;ZORO=1;SB oH1Z;JS#OPTO;EN
#H1DW;PNEC=6;SENINP=iH1Z;ZORO=0;CB oH1Z;JS#OPTO;EN
#H1RA;EN
#H1RB;EN

#H2VLON;JP#NOOP,VLV=0;CB oH2V;AP_TP=TIME;EN
#H2VLOF;JS#APRS,@OUT[oH2V]=0;SB oH2V;EN
#H2UP;PNEC=7;SENINP=iH2Z;ZORO=1;SB oH2Z;JS#OPTO;EN
#H2DW;PNEC=8;SENINP=iH2Z;ZORO=0;CB oH2Z;JS#OPTO;EN
#H2RA;PNEC=13;SENINP=iH2RA;ZORO=0;SB oH2RB;CB oH2RA;JS#OPTO;EN
#H2RB;PNEC=14;SENINP=iH2RB;ZORO=0;SB oH2RA;CB oH2RB;JS#OPTO;EN

#H3VLON;EN
#H3VLOF;EN
#H3UP;EN
#H3DW;EN
#H3RA;EN

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#H3RB;EN

```
#SOLV
  CB oSOLV
  SB oMATV
  SOLVENT=1
  BV
EN
```

```
#MATV
  CB oMATV
  SB oSOLV
  SOLVENT=0
  BV
EN
```

```
#NOOP;EN
#APRS;AP_TP=TIME;EN
#EOM
EN
\
```

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```

REM Machine Style: 350_W3SD
NO Author: JBB Date: 10/09/2006 Version: 1.00
NO Project: SPCX2115 Serial #: W3267 Company: Space X
NO Modified by: NS Date: 5/1/09
REM PathMaster version: 2.00+
REM
REM =====
REM Revision History
REM =====
REM Change: Date: By:
REM -----
REM - Added Teach Pendant Routines. 7/3/02 TMB
REM - Added Solvent Cup Routines. 7/3/02 TMB
REM - Added Z Axis Scaling (Requires n17e firmware). 2/06/04 TMB
REM 2- Modified Cal routine, Solvent position 6/23/09 AH
REM 3- Added Y offset to Home Routine. 7/2/09 AJH
REM 5- Added Auto Solvent Flush 10/11/13 FP
REM -----
REM
REM This software, including the information contained
REM herein, is the property of Precision Valve & Automation,
REM Inc. or its licensee and is considered confidential and proprietary
REM information. It is delivered on the express condition that
REM it not be used, disclosed, or reproduced in whole or in
REM part, for any reason without prior written consent of
REM Precision Valve & Automation, Inc.
REM
REM (C) 2006 Precision Valve & Automation, Inc.
REM
REM !!!! Startup And Scan Routines (Thread 0) !!!!
#AUTO;PASSED=0;POS_VAL=0;FANPASS=0
#AUTO1;DOG=40;TRY_RES=0;SDE=0
#AUTO2;AB1;JS#SCALE;JS#PRE_CHK
#SCAN;AP_TE=(TIME-AP_TP)*AP_EN;JP#FESTOP,(@IN[iFLOW]*XFL_EN)=1
JP#ESTOP,@IN[iESTOP]=1
JP#ESTOP,(1-@IN[iDOOR])&DRFLAG=1
JP#ESTOP,(1-@IN[iDOOR])&@IN[iBYPASS]=1
JP#ESTOP,LL_ERR<>0;DOG=67
JP#ESTOP,VPNT0=1
JS#OSTOP,(OUTAC+@IN[FKEY1])=0;FPOWER=1;JP#SCAN
#OSTOP;CSTOP=1;EN
#FESTOP;FAN_ERR=1;JP#ESTOP

REM !!!! Auxiliary Error Routines (Thread 1) !!!!
#KEYMON;JP#KEYMON,MERR*(1-@IN[FKEY1])<>-1;KEY1=1;EN

REM !!!! Emergency Stop and Error Routine (Thread 0) !!!!
#ESTOP;ETIME=TIME;HX1;HX2;HX3
IF (@OUT[oSOLV]=1)
OP $EF,$FFFF,$FFFF,$FFFF,$FFFF
ELSE
OP $EF,$7FFF,$FFFF,$FFFF,$FFFF
ENDIF

```

3267_M05.txt[8/25/2017 9:14:52 AM]

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```
WT100;AB1;MO;KEY1=0;MEC=20
JS#SS_ER,ERX=30000;ERY=30000;ERZ=30000;MERR=0;TEACH=0;FPOWER=0;XQ#KEYMON,2
#ESTOP1;WT150;MEC=1;JP#S200,@IN[iESTOP]=1
MEC=3;JP#S200,(1-@IN[iDOOR])&@IN[iBYPASS]=1
MEC=3;JP#S200,DRFLAG&(1-@IN[iDOOR])=1
MEC=4;JP#S210,LL_ERR=14;MEC=5;JP#S210,LL_ERR=39
MEC=6;JP#S198,FAN_ERR=1
MEC=7;JP#S199,VPNTO=1;JP#ESTOP2,POS_VAL=0
MEC=-1;JP#S208,KEY1=0;JS#FKEYREL;MERR=0
ERX=1000;ERY=1000;ERZ=1000;JS#DR_CLOS;PING=0;AP_OUT=1
MODE=0
HX1;HX2;ACFLAG=0;VLV=VSTORE;SB5;WT700;CS;SH;WT100;XQ#CS_MN1,1;JP#SCAN
#ESTOP2;MERR=-2;JS#S209;JS#WAIT_F1;HX1;HX2;ZS0;DP 0,0,0;JP#AUTO1
```

```
REM !!!! Command Error Routine (Thread 0) !!!!
#CMDERR;HX1;HX2;HX3;ST;AM;MO
IF (@OUT[oSOLV]=1)
  OP $EF,$FFFF,$FFFF,$FFFF,$FFFF
ELSE
  OP $EF,$7FFF,$FFFF,$FFFF,$FFFF
ENDIF
SH;TEACH=0;FPOWER=0;ERR=_TC;MEC=11
LINE=_ED;MERR=11;JS#SS_ER;JP#GSERR,SDE=41;JP#RESET,INIT*ERR=9
JP#RESET,INIT*ERR=83;JS#S201;JS#FKEYREL;JS#ER_WT;HX1;JP#AUTO1
#GSERR;JS#S206;HX
```

```
REM !!!! Position Error Routine (Thread 0) !!!!
#POSERR;HX1;HX2;HX3;JS#S202;ST;AM;MO
IF (@OUT[oSOLV]=1)
  OP $EF,$FFFF,$FFFF,$FFFF,$FFFF
ELSE
  OP $EF,$7FFF,$FFFF,$FFFF,$FFFF
ENDIF
TEACH=0;POS_VAL=0;FPOWER=0
MEC=12;MERR=12;JS#SS_ER;JS#FKEYREL;JS#ER_WT
HX1;ZS0;DP 0,0,0;JP#AUTO1
```

```
REM !!!! Limit Error Routine (Thread 0) !!!!
#LIMSWI;TEACH=0;JP#LS_HOME,HOMING=1;POS_VAL=0;HX1;HX2;HX3;JS#S203;ST;AM;MO
MEC=13;MERR=13;JS#SS_ER;FPOWER=0
IF (@OUT[oSOLV]=1)
  OP $EF,$FFFF,$FFFF,$FFFF,$FFFF
ELSE
  OP $EF,$7FFF,$FFFF,$FFFF,$FFFF
ENDIF
JS#FKEYREL
JS#ER_WT;HX1;ZS0;DP 0,0,0;JP#AUTO1
#LS_HOME;RE
```

```
REM !!!! Startup Delay for Fan !!!!
#FAN_WT;HX1;FAN_WT=60000
FAN_INC=1000;JS#S159;WT2000;JP#FAN_ER,@IN[iFLOW]=1;JS#S160
#FAN_WT1;WT FAN_INC;JS#S161;FAN_WT=(FAN_WT-FAN_INC)
JP#FAN_ER,@IN[iFLOW]=1;JP#FAN_WT1;FAN_WT>0;FAN_ERR=0;FANPASS=1;EN
```

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EXHIBIT 34
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520VA-1217

#FAN_ER;ZS1;FAN_ERR=1;FANPASS=0;JP#ESTOP

REM !!!! Machine Error Subroutines (Thread 0) !!!!

#ER_WT;JP#NOOP,@IN[FKEY1]=0;JP#ER_ST,@IN[FKEY5]=0;JP#ER_WT
#ER_ST;JS#FKEYREL;JS#SS_MN;JS#ER_SC;JP#ER_WT
#ER_SC;JS#FKEYREL;JS#S201,MERR=11;JS#S202,MERR=12;JS#S203,MERR=13;EN

REM !!!! Pre-Start Routines !!!!

#PRE_CHK;JS#INIT;JS#FAN_WT,((1-FANPASS)*XFL_EN)=1;JS#SF_MN,PASSED=0;SB5
JP#PRE_HM,POS_VAL=0;ACM_ER=(@ABS[TEX]+@ABS[TEY]+@ABS[TEZ])
JP#PRE_HM,ACM_ER>800;XQ#CS_MN1,1;EN
#PRE_HM;POS_VAL=0;XQ#CS_MN,1;EN

REM !!!! Start-up Safety Check (Thread 0) !!!!

#SF_MN;MO;CHECK=0,VFAIL=0
JS#CLS;JS#L1;MG{P2}{N}"Machine Safety Check"
VESPP=1;VDSPP=1;JS#L2;MG{P2}{N}"Press F1 to initiate."
JS#WAIT_F1
#SF_LP;JP#SF_FE,VFAIL=1;JP#SF_FD,VFAIL=2;JP#SF_FP,VFAIL=5
JP#SF_NE,@IN[iESTOP]=1;JP#SF_ND,@IN[iDOOR]=0;JP#SF_NK,@IN[iBYPASS]=0
JP#SF_CP,CHECK=0;JP#SF_CE,CHECK=1;JP#SF_CD,CHECK=2;PASSED=1;EN

#SF_NE;JS#CLS;JS#L1;MG{P2}{N}"Undo the EStop button.";CKSEN=iESTOP
JS#S_ZERO;JP#SF_LP
#SF_ND;JS#CLS;JS#L1;MG{P2}{N}"Close the door.";CKSEN=iDOOR
JS#S_ONE;JP#SF_LP
#SF_NK;JS#CLS;JS#L1;MG{P2}{N}"Turn the Door Bypass key to OFF";CKSEN=iBYPASS
JS#S_ONE;JP#SF_LP
#SF_CP;CB5;VCHECK=iPOWER;VSTATE=0;VFAIL=5;JS#SF_DD;JP#SF_LP,VFAIL<>0;SB5
VFAIL=5;VSTATE=1;JS#SF_DD;CHECK=1;JP#SF_LP
#SF_CE;VCHECK=iESTOP;JS#CLS;JS#L1;MG{P2}{N}"Press the EStop button.";VESPP=1
VSTATE=1;VFAIL=1;JS#SF_DD;JP#SF_LP,VFAIL<>0;VCHECK=iPOWER;VSTATE=0;VFAIL=5
VESPP=0;JS#SF_DD;VESPP=1;CHECK=2;JP#SF_LP
#SF_CD;VCHECK=iDOOR;JS#CLS;JS#L1;MG{P2}{N}"Open the door.";VDSPP=1
VSTATE=0;VFAIL=2;JS#SF_DD;JP#SF_LP,VFAIL<>0;VCHECK=iPOWER;VSTATE=0;VFAIL=5
VDSPP=0;JS#SF_DD;VDSPP=1;CHECK=3;JP#SF_LP
#SF_DD;SFTMR=TIME;WT500
#SF_DD1;JP#SF_DD2,(VFAIL-1)*(@IN[iESTOP])*VESPP<>0
JP#SF_DD2,(VFAIL-2)*(1-@IN[iDOOR])*VDSPP<>0
JP#SF_DD2,@IN[iBYPASS]=0
JP#NOOP,(TIME-SFTMR)>8000;JP#SF_DD1,@IN[VCHECK]<>VSTATE;VFAIL=0;EN
#SF_DD2;ZS1;VFAIL=0;JP#SF_LP
#SF_FP;CB5;JS#CLS;JS#L1;MG{P2}{N}"Power check failed.";JP#SF_FAIL
#SF_FE;JS#CLS;JS#L1;MG{P2}{N}"EStop button failed.";JP#SF_FAIL
#SF_FD;JS#CLS;JS#L1;MG{P2}{N}"Door safety failed.";JP#SF_FAIL
#SF_FAIL;JP#SF_OVER,SAFE<>0;JS#L2;MG{P2}{N}"Press F1 to repeat test."
JS#WAIT_F1;SAFE=1;JP#SF_MN
#SF_OVER;JS#L2;MG{P2}{N}"Repair and restart machine.";ZS0;HX

REM !!!! Program Status Report (Thread 0 or 1) !!!!

#SS_MN;JS#CLS
JS#L1;MG{P2}{N}"Machine Status Report. Press ";MG{P2}{N}"F1 to "
JS#L2;MG{P2}{N}"scroll through screens or F8 t";MG{P2}{N}"o quit. "
JS#SS_LP

JS#CLS;JS#L1;MG{P2}{N}"X-axis Enc.Pos. Com.Pos. P"
MG{P2}{N}"os.Err. "
JS#L2;MG{P2}{N}" "{F6.0}_TPX," "{F6.0}_RPX," "{F6.0}_TEX
JS#SS_LP

JS#CLS
JS#L1;MG{P2}{N}"Y-axis Enc.Pos. Com.Pos. P";MG{P2}{N}"os.Err. "
JS#L2;MG{P2}{N}" "{F6.0}_TPY," "{F6.0}_RPY," "{F6.0}_TEY
JS#SS_LP

JS#CLS
JS#L1;MG{P2}{N}"Z-axis Enc.Pos. Com.Pos. P";MG{P2}{N}"os.Err. "
JS#L2;MG{P2}{N}" "{F6.0}_TPZ," "{F6.0}_RPZ," "{F6.0}_TEZ
JS#SS_LP

JS#CLS;N1=_MOX;JS#L1;MG{P2}{N}"X-axis Motors On/Off Torque"
MG{P2}{N}" Tor.Lim.";JS#L2;MG{P2}{N}" "HLW[N1]{S3}
MG{P2}{N}" "{F1.4}_TTX," "{F1.4}_TLX
JS#SS_LP

JS#CLS;N1=_MOY;JS#L1;MG{P2}{N}"Y-axis Motors On/Off Torque"
MG{P2}{N}" Tor.Lim.";JS#L2;MG{P2}{N}" "HLW[N1]{S3}
MG{P2}{N}" "{F1.4}_TTY," "{F1.4}_TLY
JS#SS_LP

JS#CLS;N1=_MOZ;JS#L1;MG{P2}{N}"Z-axis Motors On/Off Torque"
MG{P2}{N}" Tor.Lim.";JS#L2;MG{P2}{N}" "HLW[N1]{S3}
MG{P2}{N}" "{F1.4}_TTZ," "{F1.4}_TLZ
JS#SS_LP

JS#CLS;N1=_HMX;N2=_LFX;N3=_LRX
JS#L1;MG{P2}{N}"X-axis Sensors Home For.Lim.";MG{P2}{N}" Rev.Lim."
JS#L2;MG{P2}{N}" "HLW[N1]{S3}," "HLW[N2]{S3}
MG{P2}{N}" "HLW[N3]{S3}
JS#SS_LP

JS#CLS;N1=_HMY;N2=_LFY;N3=_LRY
JS#L1;MG{P2}{N}"Y-axis Sensors Home For.Lim.";MG{P2}{N}" Rev.Lim."
JS#L2;MG{P2}{N}" "HLW[N1]{S3}," "HLW[N2]{S3}
MG{P2}{N}" "HLW[N3]{S3}
JS#SS_LP

JS#CLS;N1=_HMZ;N2=_LFZ;N3=_LRZ
JS#L1;MG{P2}{N}"Z-axis Sensors Home For.Lim.";MG{P2}{N}" Rev.Lim."
JS#L2;MG{P2}{N}" "HLW[N1]{S3}," "HLW[N2]{S3}
MG{P2}{N}" "HLW[N3]{S3}
JS#SS_LP

JS#CLS
JS#L1;MG{P2}{N}"X-axis Tuning KD KP ";MG{P2}{N}" KI "
JS#L2;MG{P2}{N}" "{F3.2}_KDX," "{F3.2}_KPX," "{F3.2}_KIX
JS#SS_LP

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JS#CLS

JS#L1;MG{P2}{N}"Y-axis Tuning KD KP ";MG{P2}{N}" KI "
JS#L2;MG{P2}{N}" ",{F3.2}_KDY," ",{F3.2}_KPY," ",{F3.2}_KIY
JS#SS_LP

JS#CLS

JS#L1;MG{P2}{N}"Z-axis Tuning KD KP ";MG{P2}{N}" KI "
JS#L2;MG{P2}{N}" ",{F3.2}_KDZ," ",{F3.2}_KPZ," ",{F3.2}_KIZ
JS#SS_LP;EN

#SS_LP;JP#WAIT_F1,@IN[FKEY1]=0;JP#SS_LP1,@IN[FKEY8]=0;JP#SS_LP
#SS_LP1;ZS1;JS#FKEYREL;EN
#SS_ER,JP#NOOP,REPORT=0;MG;MG"Error Cause: "{N};MG HLW[MEC]{S}
MG"E-Stop "{N};MG@IN[iESTOP]{F1.0}
MG"Door: "{N};MG@IN[iDOOR]{F1.0}
MG"Door Bypass: "{N};MG@IN[iBYPASS]{F1.0}
MG"Exhaust Flow: "{N};MG@IN[iFLOW]{F1.0}
MG"Material A Level: "{N};MG@IN[iLEVELA]{F1.0}
MG"Material B Level: "{N};MG@IN[iLEVELB]{F1.0}
MG"Stop Codes (x,y,z);MG_SCX{F3.0}{N};MG_SCY{F3.0}{N}
MG_SCZ{F3.0}{N}
MG"Current Error: "{N};TC1;MG"Error on line: ",{F3.0}LINE
MG"Current Position (x,y,z)".TPXYZ{F6.0}
MG"Position Error (x,y,z);TEXYZ{F6.0};EN

REM !!!! Initialization Routine (Thread 0) !!!!

#INIT;HX1;HX2;HX3;INIT=0;PMX=2;CO 14
OP \$EF,\$FFFF,\$FFFF,\$FFFF,\$FFFF
CS;JS#INITLCD;JS#S001;WT2000;DA*[0];JS#FKEYREL
DM PT_SBY[4];PT_CAL[4];PT_APG[4];A_HEAD[5];AXIS[6];ASTRSK[4];HLW[30]
DM R_HEAD[5];OPF1[20];OPF2[20];OPF3[20];OPF4[20];ECOD1[10];ECOD2[10]
DM ECOD3[10];ECOD4[10];ECOD5[10];A2HEAD[5];PT_SOL[5]
ASTRSK[0]=" ";ASTRSK[1]="*";ASTRSK[2]="*";FPOWER=0;KEY1=0
ASTRSK[3]=" ";HLW[0]="ON ";HLW[1]="OFF";HLW[2]="OFF";HLW[3]="ON "
HLW[11]="ComErr";HLW[12]="PosErr";HLW[13]="LimErr";HLW[20]="I/O "
AXIS[1]="X&Y";AXIS[2]="X ";AXIS[3]="Y ";AXIS[4]="Z ";ERR=0;LINE=0;REPORT=0
AXIS[5]="W ";OUTAC=1;VLV=1;HOMING=1;VPNT0=0;SAFE=0;TEACH=0;MODE=0;ST_BY=0
AP_TE=0;AP_TP=TIME;ACFLAG=0;VSTORE=1;CAXIS=1;CHEAD=1;PLYBCK=0;FAN_ERR=0
PNEC=0;PING=0;ACINPT=0;VCLEAR=0;AP_OUT=1;FLSO_TM=TIME
DRFLAG=1;MERR=0;JS#GETASN;JS#IMACH;SDE=41;GS#IPROG;#EOM;SDE=0;JS#IPROG
LL_ERR=0;INIT=1;JP#INIT2,CPROG<=KNPROG;CPROG=1
#INIT2;JS#LPPROG;JS#CHECK;INIT=0;EN

REM !!!! Check Variables And Reset Routines (Thread 0) !!!!

#CHECK;JP#RESET,CPROG<1;JP#RESET,CPROG>KNPROG;JP#RESET,CCNT<0
JP#RESET,FANPASS<0;JP#RESET,POS_VAL<0
JP#RESET,FNF_EN<0
JP#RESET,FNF_TM<0
JP#RESET,FLUSH_TM<0
JP#RESET,FILL_TM<0
EN
#RESET;JS#S204;WT2000;JP#S205,TRY_RES=1;HX1;HX2;HX3
DA*,*[0];CCNT=0;CPROG=1;FANPASS=0;POS_VAL=0

```
FNF_EN=0
FNF_TM=1800000
FLUSH_TM=30000
FILL_TM=30000
TRY_RES=1;PASSED=0;JS#S100;ZS0;JP#AUTO2
```

REM !!!! Load Program Routine (Thread 0) !!!!

```
#LPPROG;SDE=41;JP#LP2,CPROG>1;GS#PROG1,#PROG;JP#LX
#LP2;JP#LP4,CPROG>3;GS#PROG2,#PROG;JP#LX,CPROG=2;GS#PROG3,#PROG;JP#LX
#LP4;JP#LP6,CPROG>5;GS#PROG4,#PROG;JP#LX,CPROG=4;GS#PROG5,#PROG;JP#LX
#LP6;JP#LP8,CPROG>7;GS#PROG6,#PROG;JP#LX,CPROG=6;GS#PROG7,#PROG;JP#LX
#LP8;JP#LP10,CPROG>9;GS#PROG8,#PROG;JP#LX,CPROG=8;GS#PROG9,#PROG;JP#LX
#LP10;JP#LP12,CPROG>11;GS#PROG10,#PROG;JP#LX,CPROG=10;GS#PROG11,#PROG;JP#LX
#LP12;JP#LP14,CPROG>13;GS#PROG12,#PROG;JP#LX,CPROG=12;GS#PROG13,#PROG;JP#LX
#LP14;JP#LP16,CPROG>15;GS#PROG14,#PROG;JP#LX,CPROG=14;GS#PROG15,#PROG;JP#LX
#LP16;JP#LP18,CPROG>17;GS#PROG16,#PROG;JP#LX,CPROG=16;GS#PROG17,#PROG;JP#LX
#LP18;JP#LP20,CPROG>19;GS#PROG18,#PROG;JP#LX,CPROG=18;GS#PROG19,#PROG;JP#LX
#LP20;JP#LP22,CPROG>21;GS#PROG20,#PROG;JP#LX,CPROG=20;GS#PROG21,#PROG;JP#LX
#LP22;JP#LP24,CPROG>23;GS#PROG22,#PROG;JP#LX,CPROG=22;GS#PROG23,#PROG;JP#LX
#LP24;JP#LP26,CPROG>25;GS#PROG24,#PROG;JP#LX,CPROG=24;GS#PROG25,#PROG;JP#LX
#LP26;JP#LP28,CPROG>27;GS#PROG26,#PROG;JP#LX,CPROG=26;GS#PROG27,#PROG;JP#LX
#LP28;JP#LP30,CPROG>29;GS#PROG28,#PROG;JP#LX,CPROG=28;GS#PROG29,#PROG;JP#LX
#LP30;JP#LP32,CPROG>31;GS#PROG30,#PROG;JP#LX,CPROG=30;GS#PROG31,#PROG;JP#LX
#LP32;GS#PROG32,#PROG;JP#LX
#LX;SDE=0;EN
```

REM !!!! Home Routine (Thread 1) !!!!

```
#MV_HOME;JS#DR_CLOS;JS#S019;POS_VAL=0;HOMING=1
JS#TUNE;ST;AM
FL 200000,200000,200000
BL -200000,-200000,-200000
AC 150000,150000,150000/SCALE_Z
DC 150000,150000,150000/SCALE_Z
OE 1,1,1;JS#ALLUP;ERX=1000;ERY=1000;ERZ=1000;SH
FEZ;SPZ=30000/SCALE_Z;BGZ;AMZ;PR,1500;BGZ;AMZ
FEZ;SPZ=2000/SCALE_Z;BGZ;AMZ;PR,1000;SPZ=20000/SCALE_Z;BGZ;AMZ;DPZ=0
FLZ=30000;BLZ=-3000
FEXY;SP 10000,10000;BGXY;AMXY;PR 3000,3000;SP 500,500;BGXY;AMXY
FEXY;SP 500,500;BGXY;AMXY;PR 3000,3000;SP 2000,2000;BGXY;AMXY
DP 0,-703;JS#TUNE;POS_VAL=1;HOMING=0;EN
```

REM !!!! Move To Stand-By Routine (Thread 1) !!!!

```
#MV_SBY;JS#DR_CLOS;JS#ALLUP;SP 60000,60000,100000/SCALE_Z
AC 150000,150000,150000/SCALE_Z;DC 150000,150000,150000/SCALE_Z
SH;DELTAS=@ABS[_TPX-PT_SBY[0]]+@ABS[_TPY-PT_SBY[1]]+@ABS[_TPZ-PT_SBY[2]]
JS#SAFEZ,DELTAS>10
PA PT_SBY[0],PT_SBY[1],PT_SBY[2];BGXY;AMXY;BGZ;AMZ
JS#TUNE;ST_BY=1;EN
```

REM !!!! Flush/Fill Main Screen !!!!

```
#SOFL_MN
JS#FKEYREL
FNF_FLAG=0
JS#S006
```

```
AC 100000,100000,100000
DC 50000,50000,50000
SP 50000,50000,100000/SCALE_Z
JS#DR_CLOS;JS#SAFEZ;PA PT_APG[0],PT_APG[1],PT_APG[2];BGXY;AMXY
BGZ;AMZ;'JS#H1DW';JS#H2DW;JS#H3DW
#SOFL_LP
JP#SOFLEND,@IN[FKEY1]=0
JP#SO_FLSH,@IN[FKEY3]=0
JP#MAT_FIL,@IN[FKEY4]=0
JP#SO_FNF,@IN[FKEY6]=0
IF (FNF_FLAG=1)
    FNF_FLAG=0
ENDIF
JP#SOFL_LP

#SOFLEND
JS#FKEYREL
JP#CS_MN1

#SO_FLSH
JS#S007
CB oSOLV;WT1500
JS#H1VLON;JS#H2VLON;JS#H3VLON
TEMP_TM=TIME
#WT_FLSH
JP#ABRTSF,(((IN[FKEY1]=0)&(ACFLAG=0))
JP#WT_FLSH,((TIME-TEMP_TM)<FLUSH_TM)
#ABRTSF2
JS#H1VLOF;JS#H2VLOF;JS#H3VLOF
JS#S006,ACFLAG=0
JP#SOFL_LP,((FNF_FLAG=0)&(ACFLAG=0))

#MAT_FIL
JS#S008
SB oSOLV;WT1500
JS#H1VLON;JS#H2VLON;JS#H3VLON
TEMP_TM=TIME
#WT_FILL
JP#ABRTMF,(((IN[FKEY1]=0)&(ACFLAG=0))
JP#WT_FILL,((TIME-TEMP_TM)<FILL_TM)
#ABRTMF2
JS#H1VLOF;JS#H2VLOF;JS#H3VLOF
JS#S006,ACFLAG=0
JS#FKEYREL
FNF_FLAG=0
JP#SOFL_LP,(ACFLAG=0)
EN

#ABRTSF
JP#ABRTSF,(@IN[FKEY1]=0)
FNF_FLAG=0
JP#ABRTSF2

#ABRTMF
```

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JP#ABRTMF,(@IN[FKEY1]=0)
JP#ABRTMF2

#SO_FNF
FNF_FLAG=1
JP#SO_FLSH

#AC_FNF
JP#AC_FNF,_XQ2>0
JS#ALLUP
JS#SAFEZ
AC 100000,100000,100000
DC 50000,50000,50000
SP 50000,50000,100000/SCALE_Z
JS#DR_CLOS,JS#SAFEZ,PA PT_APG[0],PT_APG[1],PT_APG[2],BGXY,AMXY
BGZ,AMZ,'JS#H1DW','JS#H2DW','JS#H3DW

FNF_FLAG=0
IF (@OUT[oSOLV]=1)
JS#SO_FLSH
ELSE
JS#MAT_FIL
ENDIF
JS#SO_FLSH,(@OUT[oSOLV]=1)
JS#S020
FLSO_TM=TIME
SOL_TM=TIME
JS#ALLUP
JS#SAFEZ
JS#MV_SBY
EN

REM !!!! Move To Solvent Cup Routine (Thread 1) !!!!
#MV_SOL,JS#DR_CLOS,SP 100000,100000,100000/SCALE_Z
AC 200000,200000,200000/SCALE_Z;DC 200000,200000,200000/SCALE_Z
SH;DELTAS=@ABS[_TPX-PT_SOL[0]]+@ABS[_TPY-PT_SOL[1]]+@ABS[_TPZ-PT_SOL[2]]
JS#S039,DELTAS>10,JS#SAFEZ,DELTAS>10
PA PT_SOL[0],PT_SOL[1],PT_SOL[2],BGXY,AMXY,BGZ,AMZ
JS#H1DW,JS#H2DW,JS#H3DW,JS#TUNE,ST_BY=0;EN

REM !!!! Cyclestop Routine (Thread 1) !!!!
#CS_MN,JP#CS_MN,FPOWER=0,JS#S002,JS#WAIT F1,JS#MV_HOME
#CS_MN1,JS#ALLUP,JP#CS_MN1,FPOWER=0,JP#CS_MN,POS_VAL=0,JS#MV_SOL,SO_EN=1
JS#MV_SBY,SO_EN=0,CSTOP=0,ACFLAG=0
WT400,JS#S003,JS#FKEYREL
#CS_LP,JP#PG_MN,@IN[FKEY1]=0
JP#SOFL_MN,@IN[FKEY2]=0
JP#CA_MN,@IN[FKEY3]=0
JP#MA_MN,@IN[FKEY4]=0,JP#AC_MN,@IN[FKEY5]=0,JP#ST_MN,@IN[FKEY6]=0
JP#SU_MN,@IN[FKEY8]=0
JS#CS_AP,(AP_TE*AP_OUT*(1-SO_EN))>AP_TIME,JP#CS_LP
#CS_AP,XQ#A_PURGE,2
#CS_AP1,JP#CS_AP1,PING=1,JS#S003;EN

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520VA-1223

```
REM !!!! Program Selection (Thread 1) !!!!
#PG_MN;JS#S004
#PG_MN1;JS#S005;JS#FKEYREL
#PG_LP,JP#PG_BV,@IN[FKEY1]=0
    JP#PG_DW,@IN[FKEY2]=0;JP#PG_UP,@IN[FKEY3]=0;JP#PG_LP
#PG_BV;JS#S100;JS#LPPROG;JS#FKEYREL;JP#CS_MN1
#PG_DW;CPRG=CPRG-1;JP#PG_MN1,CPRG>0,CPRG=KNPROG;JP#PG_MN1
#PG_UP;CPRG=CPRG+1;JP#PG_MN1,CPRG-1<KNPROG;CPRG=1;JP#PG_MN1
```

```
REM !!!! Teach Routines (Thread 1) !!!!
#TE_F2;KEY=22*TEACH;JP#TE_FA,RKEY=53;JP#TE_FA,(TIME-TETIME)>1000;JP#TE_F2
#TE_FA;JP#TE_FB,RKEY=53;KEY=0;RKEY=0;JS#FKEYREL;JS#TKEYREL;EN
#TE_FB;CB6;WT50;SB6;KEY=0;WT100;RKEY=0;JS#FKEYREL;JS#TKEYREL;EN
#TE_PB,HX2,HX3;ST;AM;JS#S076;KEY=44*TEACH;WT2000;KEY=0;JP#MA_MN1
#TE_RS;HX0;WT100;XQ#SCAN;0;JS#DR_CLOS;TEACH=0;KEY=0;PASSED=1
    SP 60000,60000,100000/SCALE_Z
    JP#TE_RS1,PMX>1,PAZ=0,BGZ;AMZ
#TE_RS1;CS,XQ#PROG,2;PLYBCK=0
#TE_RS2;JP#TE_RS2,XQ2>0;ST;AM;JP#MA_MN1
```

```
REM !!!! Calibration Routine (Thread 1) !!!!
#CA_MN;JS#S009;JS#ALLUP;JS#FKEYREL
    SP 30000,30000,60000/SCALE_Z
    AC 100000,100000,100000/SCALE_Z
    DC 50000,50000,50000/SCALE_Z;JS#SAFEZ
    PA PT_CAL[0],PT_CAL[1],PT_CAL[2];BGXY,AMXY
    BGZ;AMZ;JS#H2DW;DRFLAG=0
#CA_LP;JP#CS_MN1,@IN[FKEY1]=0;JP#CA_HOME,@IN[FKEY3]=0;JP#CA_LP
#CA_HOME;JS#MV_HOME;JP#CA_MN
```

REM !!!! Manual Mode Functions (Thread 1) !!!!

#MA_MN

JS#FKEYREL

REM !!!! Warn if Solvent in Lines !!!

IF (@OUT[OSOLV]=0)

JS#S013

#SO_WRN2

JP#CS_MN1,@IN[FKEY1]=0

JP#IGNWRN2,@IN[FKEY2]=0

JP#SO_WRN2

#IGNWRN2

JS#FKEYREL

ENDIF

JS#MV_SBY

#MA_MN1;DRFLAG=0;CTM=0;TEACH=1;KEY=0;PLYBCK=0;RKEY=0

CAXIS=1;JS#S010;JS#FKEYREL;HX2;XQ#TB_XY,2;MODE=1

#MA_LP;JP#MA_END,@IN[FKEY1]=0;TETIME=TIME;JS#TE_F2,@IN[FKEY2]=0

JS#VV_MN,@IN[FKEY3]=0;JP#OS_MN,@IN[FKEY4]=0;JS#PR_MN,@IN[FKEY5]=0

JS#TP_MN,@IN[FKEY6]=0;JS#AX_MN,@IN[FKEY8]=0;JP#TE_PB,PLYBCK=1

JS#RM_TCH,@IN[iTEACH]+@IN[iPURGE]+@IN[iAXIS])<3;JP#MA_LP

#MA_END;JS#LED_RS;TEACH=0;JS#FKEYREL;HX2;ST;AM;VLV=VSTORE

MODE=0;JS#DR_CLOS;JS#ALLUP;JP#CS_MN1

REM !!!! Valve Function Routines (Thread 1) !!!!

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```
#VV_MN;JS#S016;JS#FKEYREL;MODE=3
#VV_LP;JP#VV_END,@IN[FKEY1]=0;JS#PR_MN,@IN[FKEY2]=0;JS#VV_SEL,@IN[FKEY3]=0
JS#VV_UP,@IN[FKEY4]=0;JS#VV_DW,@IN[FKEY5]=0;JS#VV_RA,@IN[FKEY6]=0
JS#VV_RB,@IN[FKEY7]=0;JP#NOOP,PLYBCK=1
JS#RM_TCH,(@IN[iTEACH]+@IN[iPURGE]+@IN[iAXIS])<3;JP#VV_LP
#VV_END;JS#S010;JS#FKEYREL;MODE=1;EN
#VV_SEL;CHEAD=CHEAD+1;JP#VV_SEL1,CHEAD-1<KNHEAD;CHEAD=1
#VV_SEL1;JS#FKEYREL;JS#S012;JS#S017;EN
#VV_UP;JS#H1UP,CHEAD=1;JS#H2UP,CHEAD=2;JS#H3UP,CHEAD=3;JS#FKEYREL;EN
#VV_DW;JS#H1DW,CHEAD=1;JS#H2DW,CHEAD=2;JS#H3DW,CHEAD=3;JS#FKEYREL;EN
#VV_RA;JS#H1RA,CHEAD=1;JS#H2RA,CHEAD=2;JS#H3RA,CHEAD=3;JS#FKEYREL;EN
#VV_RB;JS#H1RB,CHEAD=1;JS#H2RB,CHEAD=2;JS#H3RB,CHEAD=3;JS#FKEYREL;EN

REM !!!! One-Shot Routine (Thread 1) !!!!
#OS_MN;ST;AM;HX2;TEACH=0;WT200;ACFLAG=1;JS#MV_SBY;ACFLAG=0;DRFLAG=0
JS#LPPROG;JS#S022;CTM=0;JS#FKEYREL
#OS_LP;JP#MA_MN,@IN[FKEY1]=0;JP#OS_RUNW,@IN[FKEY2]=0
JP#OS_RUND,@IN[FKEY3]=0;JP#OS_LP
#OS_RUN;JS#AC_LL,VLV=1;JS#DR_CLOS;CTM=0;JS#S021
JS#FKEYREL;CS;CTM=TIME;XQ#PROG,2
#OS_RUN1;JP#OS_RUN1,XQ2>0;ACFLAG=1;JS#MV_SBY;ACFLAG=0;CTM=TIME-CTM
#OS_RUN2;CCNT=CCNT+1;JP#OS_MN
#OS_RUNW,VLV=1;JP#OS_RUN
#OS_RUND,VLV=0;JP#OS_RUN

REM !!!! Manual Purge (Thread 1) !!!!
#PR_MN;VLV=1;JS#H1VLON,CHEAD=1;JS#H2VLON,CHEAD=2;JS#H3VLON,CHEAD=3
JS#FKEYREL;JS#TKEYREL;JS#H1VLOF,CHEAD=1;JS#H2VLOF,CHEAD=2;JS#H3VLOF,CHEAD=3;EN

REM !!!! Tell Position Routine (Thread 1) !!!!
#TP_MN;JS#CLS;JS#S041;JS#FKEYREL;JS#S010;EN

REM !!!! Select Axis Routines (Thread 1) !!!!
#AX_MN;JS#S015;JS#FKEYREL;MODE=2
#AX_LP;JP#AX_END,@IN[FKEY1]=0;TETIME=TIME;JS#TE_F2,@IN[FKEY2]=0
JS#PR_MN,@IN[FKEY3]=0;JS#AX_XY,@IN[FKEY4]=0;JS#AX_X,@IN[FKEY5]=0
JS#AX_Y,@IN[FKEY6]=0;JS#AX_Z,@IN[FKEY7]=0;JP#NOOP,PLYBCK=1
JS#RM_TCH,(@IN[iTEACH]+@IN[iPURGE]+@IN[iAXIS])<3;JP#AX_LP
#AX_END;JS#FKEYREL;JS#S010;MODE=1;EN
#AX_XY;CAXIS=1;JS#AX_SCR;JS#LED_XY,SX=FSTX,SY=FSTY,SZ=0;JP#AX_DN
#AX_X;CAXIS=2;JS#AX_SCR;JS#LED_X;SY=0;SX=FSTX,SZ=0;JP#AX_DN
#AX_Y;CAXIS=3;JS#AX_SCR;JS#LED_Y;SX=0;SY=FSTY,SZ=0;JP#AX_DN
#AX_Z;CAXIS=4;JS#AX_SCR;JS#LED_Z;SX=0;SY=0;SZ=FSTZ;JP#AX_DN
#AX_SCR;JS#S011,MODE=2;JS#S011B,MODE=1;EN
#AX_DN;JS#FKEYREL;JS#TKEYREL;EN

REM !!!! Auto Cycle Routines (Thread 1) !!!!
#AC_MN
JS#FKEYREL
JS#AC_LL,VLV=1
REM !!!! Warn if Solvent in Lines !!!
IF (@OUT[oSOLV]=0)
JS#S013
#SO_WRN
```

```
JP#CS_MN1,@IN[FKEY1]=0
JP#IGN_WRN,@IN[FKEY2]=0
JP#SO_WRN
#IGN_WRN
ENDIF
JS#FKEYREL
ACFLAG=1
JS#LPPROG;CTM=0;JS#A_PURGE,SO_EN=1
JP#AC_MN1,@IN[iSTART]=1;FLSO_TM=TIME;JS#S045
#AC_MNX;JP#AC_MNX,@IN[iSTART]=0
#AC_MN1;SOL_TM=TIME;JS#S020;JS#FKEYREL
#AC_LP
JP#AC_END,@IN[FKEY1]=0
JS#AC_LL,VLV=1
JS#AC_DR,_XQ2<0
JS#AC_SO,((TIME-SOL_TM)*ST_BY*SO_EN)>SLP_TM
JP#AC_S,@IN[iSTART]=0
JS#AC_AP,(AP_TE*AP_OUT*(1-SO_EN))>AP_TIME
JS#AC_FNF,(((TIME-FLSO_TM)*FNF_EN)>FNF_TM)
JP#AC_LP
#AC_END;JP#AC_END,PING=1;JS#S100;ACFLAG=0;JP#CS_MN1
#AC_S;JP#AC_S1,ST_BY=1;XQ#A_PURGE,2
#AC_S1;JS#DR_CLOS,JP#AC_S1,PING=1;CTM=0;CS;JS#S021;JS#FKEYREL
CTM=TIME,XQ#PROG,2
#AC_2;JP#AC_2,_XQ2>0;JP#AC_2,@IN[iSTART]=0
CCNT=CCNT+1;JS#MV_SBY;CTM=TIME-CTM;DRFLAG=0;JP#AC_MN1
#AC_AP;JP#NOOP,PING=1;JS#A_PURGE;JS#S020;EN
#AC_DR;DRFLAG=0;EN
#AC_LL;LL_VAR=14;JP#AC_LLE,@IN[iLEVELA]&LLA_EN=1;LL_VAR=39
JP#AC_LLE,@IN[iLEVELB]&LLB_EN=1;EN
#AC_LLE;LL_ERR=LL_VAR;WT999;EN
```

REM !!!! Move to Solvent Cups !!!!

```
#AC_SO;JS#ALLUP,JP#AC_SO,_XQ2>0;JS#MV_SOL;JS#S020;EN
```

REM !!!! Status Routines (Thread 1) !!!!

```
#ST_MN;JS#S024
#ST_LP;JP#ST_END,@IN[FKEY1]=0;JP#ST_SS,@IN[FKEY3]=0;JP#ST_LP
#ST_END;JP#CS_MN1
#ST_SS;JS#SS_MN;JP#ST_MN
```

REM !!!! Setup Routines (Thread 1) !!!!

```
#SU_MN;JS#S030;JS#SU_SCR
#SU_LP;JP#SU_END,@IN[FKEY1]=0
JP#SU_CNT,@IN[FKEY2]=0;JP#SU_CRS,@IN[FKEY3]=0
JP#SFMF_SU,@IN[FKEY4]=0
JS#SU_APON,@IN[FKEY5]=0;JS#SU_APOF,@IN[FKEY6]=0
JS#SU_WET,@IN[FKEY7]=0;JS#SU_DRY,@IN[FKEY8]=0;JP#SU_LP
#SU_END;JS#FKEYREL;JS#S100;VLV=VSTORE;JP#CS_MN1
#SU_CNT;JS#S031;JS#FKEYREL;JP#SU_MN
#SU_CRS;CCNT=0;JS#S100;JP#SU_MN
#SU_APON;AP_EN=1;JP#SU_SCR
#SU_APOF;AP_EN=0;JP#SU_SCR
#SU_WET;VSTORE=1;JP#SU_SCR
```

```
#SU_DRY;VSTORE=0
#SU_SCR;JS#FKEYREL;LCD1=AP_EN;LCD3=VSTORE;JS#S025;EN
```

REM !!!! Solvent Flush/Material Fill Setup Options !!!!

```
#SFMF_SU
  JS#FKEYREL
  JS#S0301
  JS#S0301A
  JS#S0301B

  #SFMF_LP
  JP#SFMFEND,(@IN[FKEY1]=0)
  JP#ACSF_MN,(@IN[FKEY3]=0)
  JS#SF_UP,(@IN[FKEY5]=0)
  JS#SF_DW,(@IN[FKEY6]=0)
  JS#MF_UP,(@IN[FKEY7]=0)
  JS#MF_DW,(@IN[FKEY8]=0)
  JP#SFMF_LP
EN
```

```
#SF_UP
STP_TM=TIME;STEP=1000
#SF_UP1
  FLUSH_TM=FLUSH_TM+STEP;JS#SF_RS1,FLUSH_TM>MAX_FLSH;JS#S0301A;WT75
  JS#STEP_C,(TIME-STP_TM)>2500;JP#SF_UP1,@IN[FKEY5]=0
EN
```

```
#SF_DW
STP_TM=TIME;STEP=1000
#SF_DW1
  FLUSH_TM=FLUSH_TM-STEP;JS#SF_RS0,FLUSH_TM<MIN_FLSH;JS#S0301A;WT75
  JS#STEP_C,(TIME-STP_TM)>2500;JP#SF_DW1,@IN[FKEY6]=0
EN
```

```
#MF_UP
STP_TM=TIME;STEP=1000
#MF_UP1
  FILL_TM=FILL_TM+STEP;JS#MF_RS1,FILL_TM>MAX_FILL;JS#S0301B;WT75
  JS#STEP_C,(TIME-STP_TM)>2500;JP#MF_UP1,@IN[FKEY6]=0
EN
```

```
#MF_DW
STP_TM=TIME;STEP=1000
#MF_DW1
  FILL_TM=FILL_TM-STEP;JS#MF_RS0,FILL_TM<MIN_FILL;JS#S0301B;WT75
  JS#STEP_C,(TIME-STP_TM)>2500;JP#MF_DW1,@IN[FKEY7]=0
EN
```

```
#SFMFEND
  JP#SFMFEND,@IN[FKEY1]=0
  JP#SU_MN
```

```
#S0301;JS#CLS
JS#L1;MG{P2}{N}"F&F:  AUTO  Flsh  s. Fil  s."
JS#L2;MG{P2}{N}"EXIT  OPT    UP DW  UP DW ";EN

#S0301A;MG{P2}{N}{^17},{^25},{^150},{^18},{FLUSH_TM/1000}{F3.0};EN
#S0301B;MG{P2}{N}{^17},{^25},{^161},{^18},{FILL_TM/1000}{F3.0};EN

#SF_RS1;FLUSH_TM=MIN_FLSH;STP_TM=TIME;EN
#SF_RS0;FLUSH_TM=MAX_FLSH;STP_TM=TIME;EN
#MF_RS1;FILL_TM=MIN_FILL;STP_TM=TIME;EN
#MF_RS0;FILL_TM=MAX_FILL;STP_TM=TIME;EN
#STEP_C;STEP=STEP*5;STP_TM=TIME;EN
#STEP_D;STEP=STEP*10;STP_TM=TIME;EN

REM !!!!Auto Cycle Solvent Flush Options!!!
#ACSF_MN
JS#FKEYREL
JS#S0302
JS#S0302A
JS#S0302B
#ACSF_LP
JP#SFMF_SU,(@IN[FKEY1]=0)
JS#FNF_ON,@IN[FKEY3]=0
JS#FNF_OF,@IN[FKEY4]=0
JS#FNF_UP,(@IN[FKEY5]=0)
JS#FNF_DW,(@IN[FKEY6]=0)
JP#ACSF_LP

#FNF_UP
STP_TM=TIME;STEP=60000
#FNF_UP1
FNF_TM=FNF_TM+STEP;JS#FNF_RS1,FNF_TM>MAX_FNF;JS#S0302A;WT75
JS#STEP_D,(TIME-STP_TM)>2500;JP#FNF_UP1,@IN[FKEY5]=0
EN

#FNF_DW
STP_TM=TIME;STEP=60000
#FNF_DW1
FNF_TM=FNF_TM-STEP;JS#FNF_RS0,FNF_TM<MIN_FNF;JS#S0302A;WT75
JS#STEP_D,(TIME-STP_TM)>2500;JP#FNF_DW1,@IN[FKEY6]=0
EN

#S0302;JS#CLS
JS#L1;MG{P2}{N}"Auto Opt:  F&F  Freq  min      "
JS#L2;MG{P2}{N}"EXIT  ON OFF  UP DW      ";EN

#S0302A
MG{P2}{N}{^17},{^25},{^151},{^18},{FNF_TM/60000}{F3.0}
EN

#S0302B
MG{P2}{N}{^17},{^25},{^202},{^18},ASTRSK[FNF_EN]{S}
MG{P2}{N}{^17},{^25},{^206},{^18},ASTRSK[FNF_EN+2]{S};EN
```

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EXHIBIT 34

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531VA-1228

```
#FNF_ON;FNF_EN=1;JS#S0302B;JS#FKEYREL;EN
#FNF_OF;FNF_EN=0;JS#S0302B;JS#FKEYREL;EN
#FNF_RS1;FNF_TM=MIN_FNF;STP_TM=TIME;EN
#FNF_RS0;FNF_TM=MAX_FNF;STP_TM=TIME;EN
```

REM !!!! Auto Purge (Thread 2) !!!!

#A_PURGE

```
AP_OUT=0;PING=1;VLV=1;JS#S040
AC 100000,100000,100000
DC 50000,50000,50000
SP 50000,50000,100000/SCALE_Z
JS#DR_CLOS;JS#SAFEZ;PA PT_APG[0],PT_APG[1],PT_APG[2];BGXY;AMXY
BGZ;AMZ;JS#H1DW;JS#H2DW;JS#H3DW;JS#H1VLON;JS#H2VLON;JS#H3VLON;WT AP_LEN
JS#H1VLOF;JS#H2VLOF;JS#H3VLOF;JS#H1UP;JS#H2UP;JS#H3UP;WT200
JS#MV_SBY;AP_TE=0;AP_TP=TIME;VLV=VSTORE
PING=0;AP_OUT=1;EN
```

REM !!!! Trackball (Thread 2) !!!!

#TB_XY;ST;AM

```
DC 125000,125000,960000/SCALE_Z
AC 125000,125000,425000/SCALE_Z;JS#LED_XY
SX=FSTX;SY=FSTY;SZ=0;DE*=0;MX=0;MY=0;MZ=0;MXL=0
MYL=0;MZL=0;MT=TIME;DE MXL,MYL,MZL;MTL=MT;SH;JG 0,0,0;BGXYZ
#TB_XY1;DT=MT-MTL;MTL=MT;MT=TIME;MXL=MX;MYL=MY;MZL=MZ
MZ= DEX;MX= DEX;MY= DEY;MDT=MT-MTL;VELX=SX*(MX-MXL)/MDT
VELY=SY*(MY-MYL)/MDT;VELZ=SZ*(MZL-MZ)/MDT;JP#MCHKZP,CAXIS=4
#MCHKXP;JP#MCHKXN,VELX<0;JP#MCHKYP,_TPX+1000<_FLX;VELX=0;JP#MCHKYP
#MCHKXN;JP#MCHKYP,_TPX-1000>_BLX;VELX=0
#MCHKYP;JP#MCHKYN,VELY<0;JP#TB_XY2,_TPY+1000<_FLY;VELY=0;JP#TB_XY2
#MCHKYN;JP#TB_XY2,_TPY-1000>_BLY;VELY=0;JP#TB_XY2
#MCHKZP;JP#MCHKZN,VELZ<0;JP#TB_XY2,_TPZ+1000<_FLZ;VELZ=0;JP#TB_XY2
#MCHKZN;JP#TB_XY2,_TPZ-1000>_BLZ;VELZ=0
#TB_XY2;JG VELX,VELY,VELZ;JP#TB_XY1
```

REM !!!! Teach Pendant Routines (Thread 1) !!!!

```
#RM_TCH;JS#RM_AX,@IN[iAXIS]=0;JS#PR_MN,@IN[iPURGE]=0
TETIME=TIME;JS#TE_F2,@IN[iTEACH]=0;EN
#RM_AX;CAXIS=CAXIS+1;JS#RM_AR,CAXIS>4;JS#AX_XY,CAXIS=1
JS#AX_X,CAXIS=2;JS#AX_Y,CAXIS=3;JS#AX_Z,CAXIS=4;EN
#RM_AR;CAXIS=1;EN
#LED_XY;SB3;SB4;CB1;CB2;EN
#LED_X;SB2;SB3;SB4;CB1;EN
#LED_Y;SB1;SB3;SB4;CB2;EN
#LED_Z;SB1;SB2;SB4;CB3;EN
#LED_W;SB1;SB2;SB3;CB4;EN
#LED_RS;SB1;SB2;SB3;SB4;SB6;EN
```

REM !!!! LCD Screens !!!!

#INITLCD;CC 9600,0,0,0;WT500;JS#CLS;EN

#CLS;MG{P2}{N}{^17},{^12},{^01},{^02},{^18};EN

#L1;MG{P2}{N}{^17},{^25},{^128},{^18};EN

```
#L2;MG{P2}{N}{^17},{^25},{^192},{^18};EN

#S001;JS#CLS
JS#L1;MG{P2}{N}"Precision Valve & Automation";MG{P2}{N}" Inc"
JS#L2;MG{P2}{N}"System Initialization, please ";MG{P2}{N}"wait... ";EN

#S002;JS#CLS;JS#L1;MG{P2}{N}"Press F1 to home the system. ";EN

#S003;JS#CLS
JS#L1;MG{P2}{N}"Cycle Stop ";MG{P2}{N}" "
JS#L2;MG{P2}{N}"PROG F&F CAL MAN AUTO STAT";MG{P2}{N}" SETUP";EN

#S004;JS#CLS
JS#L1;MG{P2}{N}"Select Program: ",A_PROGA[CPROG]{S},A_PROGB[CPROG]{S}
JS#L2;MG{P2}{N}"EXIT PREV NEXT";EN

#S005
MG{P2}{N}{^17},{^25},{^144},{^18},A_PROGA[CPROG]{S},A_PROGB[CPROG]{S};EN

#S006;JS#CLS
JS#L1;MG{P2}{N}" SOLV MAT ";MG{P2}{N}"FLSH& "
JS#L2;MG{P2}{N}"EXIT FLSH FILL ";MG{P2}{N}"FILL ";EN

#S007;JS#CLS
JS#L1;MG{P2}{N}"Solvent Flush in Progress... ";MG{P2}{N}" "
JP#NOOP,(ACFLAG=1)
JS#L2;MG{P2}{N}"EXIT ";MG{P2}{N}" ";EN

#S008;JS#CLS
JS#L1;MG{P2}{N}"Material Fill in Progress... ";MG{P2}{N}" "
JP#NOOP,(ACFLAG=1)
JS#L2;MG{P2}{N}"EXIT ";MG{P2}{N}" ";EN

#S009;JS#CLS;JS#L1;MG{P2}{N}"Calibration"
JS#L2;MG{P2}{N}"EXIT HOME ";MG{P2}{N}" ";EN

#S010;JS#CLS;JS#L1;MG{P2}{N}"Jog Mode Head: ",A_HEAD[CHEAD]{S}
MG{P2}{N}A2HEAD[CHEAD]{S}," Axis: ",AXIS[CAXIS]{S}
JS#L2;MG{P2}{N}"EXIT TEACH VLV RUN PURG TP ";MG{P2}{N}" AXIS";EN

#S011;MG {P2}{N}{^17},{^25},{^157},{^18},AXIS[CAXIS]{S};EN

#S011B;MG {P2}{N}{^17},{^25},{^164},{^18},AXIS[CAXIS]{S};EN

#S012;MG {P2}{N}{^17},{^25},{^153},{^18},A_HEAD[CHEAD]{S},A2HEAD[CHEAD]{S};EN

#S013;JS#CLS
JS#L1;MG{P2}{N}"Warning! Solvent not been";MG{P2}{N}" flushed! "
JS#L2;MG{P2}{N}"EXIT CONT ";MG{P2}{N}" ";EN

#S015;JS#CLS
JS#L1;MG{P2}{N}"Trackball Control Current: ",AXIS[CAXIS]{S}
JS#L2;MG{P2}{N}"EXIT TEACH PURG X&Y X Y ";MG{P2}{N}" Z ";EN
```

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```
#S016;JS#CLS;JS#L1;MG{P2}{N}"Valve Functions  Head: "  
MG{P2}{N} A_HEAD[CHEAD]{S},A2HEAD[CHEAD]{S}  
JS#L2;MG{P2}{N}"EXIT PURG SEL UP DOWN ";MG{P2}{N}" "  
  
#S017;JP#OPT3,R_HEAD[CHEAD]=1  
MG{P2}{N}{^17},{^25},{^218},{^18}," ";EN  
  
#OPT3;MG{P2}{N}{^17},{^25},{^218},{^18},"ROTA ROTB";EN  
  
#S019;JS#CLS;JS#L1;MG{P2}{N}"Homing axes. Please wait... ";EN  
  
#S020;JS#CLS;JP#OPT1,VLV=0  
JS#L1;MG{P2}{N}"Auto Cycle WET Count:",{F8.0}CCNT;JP#OPT2  
  
#OPT1;JS#L1;MG{P2}{N}"Auto Cycle DRY Count:",{F8.0}CCNT  
  
#OPT2;JS#L2;MG{P2}{N}"STOP "  
MG{P2}{N} A_PROGA[CPROG]{S},A_PROGB[CPROG]{S};JP#NOOP,AC_TMR=0  
JP#NOOP,CTM=0;MG{P2}{N}" ",{F3.1}CTM*0.9766/1000," Sec.";EN  
  
#S021;JS#CLS  
JS#L1;MG{P2}{N}"In Cycle... Count:",{F8.0}CCNT;JP#OPT2  
  
#S022;JS#CLS  
JS#L1;MG{P2}{N}"Press F2 or F3 to run";MG{P2}{N}" 1 cycle. "  
JS#L2;MG{P2}{N}"EXIT WET DRY ",A_PROGA[CPROG]{S},A_PROGB[CPROG]{S}  
JP#NOOP,AC_TMR=0;JP#NOOP,CTM=0;MG{P2}{N}" ",{F3.1}CTM*0.9766/1000," Sec.";EN  
  
#S024;JS#CLS;JS#L1;MG{P2}{N}"Status"  
JS#L2;MG{P2}{N}"EXIT STAT ";MG{P2}{N}" ",EN  
  
#S025;LCD2=LCD1+2;LCD4=LCD3+2  
MG{P2}{N}{^17},{^25},{^213},{^18},ASTRSK[LCD1]{S}  
MG{P2}{N}{^17},{^25},{^218},{^18},ASTRSK[LCD2]{S}  
MG{P2}{N}{^17},{^25},{^223},{^18},ASTRSK[LCD3]{S}  
MG{P2}{N}{^17},{^25},{^228},{^18},ASTRSK[LCD4]{S};EN  
  
#S030;JS#CLS  
JS#L1;MG{P2}{N}"Setup Counter F&F Auto Purg";MG{P2}{N}"e Run Mode"  
JS#L2;MG{P2}{N}"EXIT CNT RES OPT ON OFF";MG{P2}{N}" WET DRY";EN  
  
#S031;JS#CLS;JS#L1;MG{P2}{N}"Count:",{F8.0}CCNT;EN  
  
#S039;JS#CLS;JS#L1;MG{P2}{N}"Moving to Solvent!!!";EN  
  
#S040;JS#CLS;JS#L1;MG{P2}{N}"AUTO PURGE!!!";EN  
  
#S041;JS#CLS;JS#L1;MG{P2}{N}"Current Position: "  
JS#L2;MG{P2}{N}"X",_TPX{F6.0},"Y",_TPY,"Z",_TPZ;EN  
  
#S045;JS#CLS;JS#L1;MG{P2}{N}"Start switches activated!"  
JS#L2;MG{P2}{N}"Deactivate to continue the pro";MG{P2}{N}"gram. ";EN
```


#S076;JS#CLS;JS#L1;MG{P2}{N}"Waiting for path...";EN

#S100;JS#CLS

JS#L1;MG{P2}{N}"Saving data...please wait.";WT150;BV;JS#FKEYREL;EN

#S159;JS#CLS

JS#L1;MG{P2}{N}"Checking for exhaust input. Ple";MG{P2}{N}"ase wait.";EN

#S160;JS#CLS

JS#L1;MG{P2}{N}"Verifying exhaust. Please wait.";MG{P2}{N}"..";EN

#S161;JS#L2;MG{P2}{N}"

",{F3.0}(FAN_WT/1000);EN

#S198;JS#CLS;JS#L1;MG{P2}{N}ECOD1[MEC]{S},ECOD2[MEC]{S}

MG{P2}{N}ECOD3[MEC]{S},ECOD4[MEC]{S},ECOD5[MEC]{S}

JS#L2;MG{P2}{N}"Press F1 to continue the progr";MG{P2}{N}"am.";MERR=MEC

JS#WAIT_F1;JS#FAN_WT;JP#ESTOP1

#S199;JP#ESTOP1,MERR=MEC;JS#CLS

JS#L1;MG{P2}{N}OPF1[PNEC]{S},OPF2[PNEC]{S},OPF3[PNEC]{S},OPF4[PNEC]{S}

MG{P2}{N}" failure.";JS#L2;MG{P2}{N}"Repair and press F1."

MERR=MEC;JS#WAIT_F1;JS#FKEYREL;VPNT0=0,PNEC=0;JP#ESTOP1

#S200;JP#ESTOP1,MERR=MEC;JS#CLS;JS#L1;MG{P2}{N}ECOD1[MEC]{S},ECOD2[MEC]{S}

MG{P2}{N}ECOD3[MEC]{S},ECOD4[MEC]{S},ECOD5[MEC]{S}

JS#L2;MG{P2}{N}"to continue the program.";MERR=MEC;JP#ESTOP1

#S201;JS#CLS;JS#L1;MG{P2}{N}"Error",{F3.0}ERR," on line",{F4.0}LINE,""

JS#L2;MG{P2}{N}"Press F1 to restart, F5 for st";MG{P2}{N}"atus. ";EN

#S202;JS#CLS

JS#L1;MG{P2}{N}"Position Error. F1-restart, F5-";MG{P2}{N}"status. "

JS#L2;MG{P2}{N}"Stop codes (x,y,z",{F3.0}_SCX,"",{F3.0}_SCY,""

MG{P2}{N}{F3.0}_SCZ;EN

#S203;JS#CLS

JS#L1;MG{P2}{N}"Limit Error. F1-restart, F5-sta";MG{P2}{N}"tus. "

JS#L2;MG{P2}{N}"Stop codes (x,y,z",{F3.0}_SCX,"",{F3.0}_SCY,""

MG{P2}{N}{F3.0}_SCZ;EN

#S204;JS#CLS;JS#L1;MG{P2}{N}"Variable error."

JS#L2;MG{P2}{N}"Initializing...";EN

#S205;JS#CLS

JS#L1;MG{P2}{N}"Unrecoverable variable error d";MG{P2}{N}"uring "

JS#L2;MG{P2}{N}"startup. Restart the machine.";HX

#S206;JS#CLS

JS#L1;MG{P2}{N}"Subroutine error. The subrout";MG{P2}{N}"ine is not"

JS#L2;MG{P2}{N}"stored in segment 1, 2 or 3.";EN

#S208;JP#ESTOP1,MERR=MEC;MERR=MEC;JS#CLS

JS#L1;MG{P2}{N}"Press F1 to return head to sta";MG{P2}{N}"ndby."

JS#L2;MG{P2}{N}" OK";JP#ESTOP1

```
#S209;JS#CLS;JS#L1;MG{P2}{N}"Press F1 to restart.";JS#L2;MG{P2}{N}" OK";EN

#S210;JP#ESTOP1,MERR=MEC;JS#CLS;JS#L1;MG{P2}{N}ECOD1[MEC]{S},ECOD2[MEC]{S}
MG{P2}{N}ECOD3[MEC]{S},ECOD4[MEC]{S},ECOD5[MEC]{S};MERR=MEC
JS#L2;MG{P2}{N}"Press F1 to continue.";JS#WAIT_F1;LL_ERR=0;JP#ESTOP1

REM !!!! Error-Checking Subroutines !!!!
#WAIT_F1;JP#WAIT_F1,@IN[80]=1;JS#FKEYREL;EN

#FKEYREL;VRESUME=@IN[73]&@IN[74]&@IN[75]&@IN[76]
VRESUME=VRESUME&@IN[77]&@IN[78]&@IN[79]&@IN[80]
JP#FKEYREL,VRESUME=0;WT50;EN

#TKEYREL;VRESUME=@IN[iTEACH]&@IN[iPURGE]&@IN[iAXIS]
JP#TKEYREL,VRESUME=0;WT50;EN

#S_ONE;JP#S_ONE,@IN[CKSEN]=0;EN

#S_ZERO;JP#S_ZERO,@IN[CKSEN]=1;EN

#OPT0;TSTART=TIME

#OPT02;JP#NOOP,@IN[SENINP]=ZORO;JP#OPT02,(TIME-TSTART)<PNT0;VPNT0=1;WT999;EN

#DR_CLOS;JP#DR_SHUT,@IN[iDOOR]=1;JS#CLS;JS#L1
MG{P2}{N}"Close door to continue."

#DR_CLO1;JP#DR_CLO1,@IN[iDOOR]<>1

#DR_SHUT;DRFLAG=1;JP#NOOP,TEACH=0;JS#CLS;JS#L1;MG{P2}{N}"Cycle in progress.";EN

#SAFEZ;PAZ=0;BGZ;AMZ;JS#ALLUP,SO_EN=1;EN

REM !!!! Group Subroutines !!!!
#ALLUP;JS#H1UP;JS#H2UP;JS#H3UP;JS#H1RA;JS#H2RA;JS#H3RA;EN

REM !!!! Variable Assignments !!!!
#GETASN;NA=0

REM -----
REM !! Inputs !!
REM -----

iESTOP=1;iSTART=2;iDOOR=3;iBYPASS=4;iPOWER=5
iLEVELA=49;iLEVELB=67
iAXIS=22;iPURGE=23;iTEACH=24
FKEY1=80;FKEY2=79;FKEY3=78;FKEY4=77;FKEY5=76;FKEY6=75;FKEY7=74;FKEY8=73
iFLOW=64

iH1Z=53

iH2Z=54
iH2RB=55
```

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iH2RA=56

REM -----
REM !! Outputs !!
REM -----

oH1Z=25
oH1V=27
oH1AT=26

oH2Z=28
oH2V=31
oH2RB=29
oH2RA=30
oSOLV=32

OPF1[1]="";OPF2[1]="";OPF3[1]="";OPF4[1]=""
OPF1[2]="";OPF2[2]="";OPF3[2]="";OPF4[2]=""
OPF1[3]="";OPF2[3]="";OPF3[3]="";OPF4[3]=""
OPF1[4]="";OPF2[4]="";OPF3[4]="";OPF4[4]=""
OPF1[5]="Spray";OPF2[5]=" Z-";OPF3[5]="slide ";OPF4[5]="UP"
OPF1[6]="Spray";OPF2[6]=" Z-";OPF3[6]="slide ";OPF4[6]="DOWN"
OPF1[7]="Dispen";OPF2[7]="se Z-";OPF3[7]="slide ";OPF4[7]="UP"
OPF1[8]="Dispen";OPF2[8]="se Z-";OPF3[8]="slide ";OPF4[8]="DOWN"
OPF1[9]="HD3";OPF2[9]=" Z-";OPF3[9]="slide ";OPF4[9]="UP"
OPF1[10]="HD3";OPF2[10]=" Z-";OPF3[10]="slide ";OPF4[10]="DOWN"
OPF1[11]="Spray";OPF2[11]=" r";OPF3[11]="otary";OPF4[11]="0 deg"
OPF1[12]="Spray";OPF2[12]=" r";OPF3[12]="otary ";OPF4[12]="45 deg"
OPF1[13]="Dispen";OPF2[13]="se r";OPF3[13]="otary ";OPF4[13]="0 deg"
OPF1[14]="Dispen";OPF2[14]="se r";OPF3[14]="otary ";OPF4[14]="45 deg"
OPF1[15]="HD3";OPF2[15]=" r";OPF3[15]="otary ";OPF4[15]="0 deg"
OPF1[16]="HD3";OPF2[16]=" r";OPF3[16]="otary ";OPF4[16]="45 deg"

ECOD1[1]="Emerge";ECOD2[1]="ncy St";ECOD3[1]="op. Re";ECOD4[1]="set bu"
ECOD5[1]="tton";ECOD1[2]="Left ";ECOD2[2]="Door ";ECOD3[2]="open. "
ECOD4[2]="Close";ECOD5[2]="";ECOD1[3]="";ECOD2[3]="Door "
ECOD3[3]="open. ";ECOD4[3]="Close";ECOD5[3]="";ECOD1[4]="Materi"
ECOD2[4]="al A L";ECOD3[4]="evel l";ECOD4[4]="ow. ";ECOD5[4]=""
ECOD1[5]="Materi";ECOD2[5]="al B L";ECOD3[5]="evel l"
ECOD4[5]="ow. ";ECOD5[5]="";ECOD1[6]="Exhaus";ECOD2[6]="t Flow"
ECOD3[6]=" low. ";ECOD4[6]="";ECOD5[6]="";EN

REM !!!! Machine-Specific Information !!!!
#IMACH;MT 1,1,1;CE 0,0,0
FSTX=20000;SLWX=10000
FSTY=20000;SLWY=10000
FSTZ=10000;SLWZ=5000

KNHEAD=2
A_HEAD[1]="Spray ";A2HEAD[1]=" ";R_HEAD[1]=0
A_HEAD[2]="Dispen";A2HEAD[2]="se ";R_HEAD[2]=1
A_HEAD[3]="HD3";A2HEAD[3]=" ";R_HEAD[3]=1

REM !!! Added Y offset to Home Routine !!!

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XOFF=0
YOFF=703
ZOFF=0

PT_APG[0]=70700;PT_APG[1]=53663;PT_APG[2]=2478
PT_CAL[0]=6660;PT_CAL[1]=41194;PT_CAL[2]=13921
PT_SBY[0]=33500;PT_SBY[1]=36600;PT_SBY[2]=250
PT_SOL[0]=70850;PT_SOL[1]=27679;PT_SOL[2]=9000

AP_EN=0;AP_LEN=2000;AP_TIME=30000;SLP_TM=30000;SO_EN=1
PNT0=4000;AC_TMR=1;LLA_EN=0;LLB_EN=0;XFL_EN=0

MIN_FLSH=0
MIN_FILL=0
MAX_FLSH=150000
MAX_FILL=150000
MIN_FNF=0
MAX_FNF=18000000

#TUNE;WT100
AC 150000,150000,150000/SCALE_Z
DC 150000,150000,150000/SCALE_Z
SP 60000,60000,100000/SCALE_Z
VA 70000,70000,70000
VD 70000,70000,70000
BL -4000,-2500,-1500
FL 71000,70500,16600
TL 9.9999,9.9999,9.9999
KD 67.99,82.43,305.75
KP 5.66,6.75,199.94
KI 0.25,0.19,0.34;EN

#SCALE;SCALE_Z=10;MO;SF 1,1,SCALE_Z;EN

REM !!!! Pneumatic and Dispensing Subroutines !!!!
#H1VLON;JP#NOOP,VLV=0;CB oH1AT;WT250;CB oH1V;AP_TP=TIME;EN
#H1VLOF;JS#APRS,@OUT[oH1V]=0;SB oH1V;WT50;SB oH1AT;EN
#H1UP;PNEC=5;SENINP=iH1Z;ZORO=1;SB oH1Z;JS#OPTO;EN
#H1DW;PNEC=6;SENINP=iH1Z;ZORO=0;CB oH1Z;JS#OPTO;EN
#H1RA;EN
#H1RB;EN

#H2VLON;JP#NOOP,VLV=0;CB oH2V;AP_TP=TIME;EN
#H2VLOF;JS#APRS,@OUT[oH2V]=0;SB oH2V;EN
#H2UP;PNEC=7;SENINP=iH2Z;ZORO=1;SB oH2Z;JS#OPTO;EN
#H2DW;PNEC=8;SENINP=iH2Z;ZORO=0;CB oH2Z;JS#OPTO;EN
#H2RA;PNEC=13;SENINP=iH2RA;ZORO=0;SB oH2RB;CB oH2RA;JS#OPTO;EN
#H2RB;PNEC=14;SENINP=iH2RB;ZORO=0;SB oH2RA;CB oH2RB;JS#OPTO;EN

#H3VLON;EN
#H3VLOF;EN
#H3UP;EN
#H3DW;EN
#H3RA;EN

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#H3RB;EN

#NOOP;EN

#APRS;AP_TP=TIME;EN

#EOM

EN

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EXHIBIT 34

Software Code: Proprietary/irrelevant

```

REM Machine Style: 350_W3SD
NO Author: JBB Date: 10/09/2006 Version: 1.00
NO Project: SPCX2115 Serial #: W3267 Company: Space X
NO Modified by: NS Date: 5/1/09
REM PathMaster version: 2.00+
REM
REM =====
REM Revision History
REM =====
REM Change:                      Date:      By:
REM -----
REM - Added Teach Pendant Routines.      7/3/02    TMB
REM - Added Solvent Cup Routines.        7/3/02    TMB
REM - Added Z Axis Scaling (Requires n17e firmware). 2/06/04    TMB
REM 2- Modified Cal routine, Solvent position 6/23/09    AH
REM 3- Added Y offset to Home Routine.      7/2/09    AJH
REM 5- Added Auto Solvent Flush            10/11/13    FP
REM -----
REM
REM This software, including the information contained
REM herein, is the property of Precision Valve & Automation,
REM Inc. or its licensee and is considered confidential and proprietary
REM information. It is delivered on the express condition that
REM it not be used, disclosed, or reproduced in whole or in
REM part, for any reason without prior written consent of
REM Precision Valve & Automation, Inc.
REM
REM (C) 2006 Precision Valve & Automation, Inc.
REM
REM !!!! Startup And Scan Routines (Thread 0) !!!!
#AUTO;PASSED=0;POS_VAL=0;FANPASS=0
#AUTO1;DOG=40;TRY_RES=0;SDE=0
#AUTO2;AB1;JS#SCALE;JS#PRE_CHK
#SCAN;AP_TE=(TIME-AP_TP)*AP_EN;JP#FESTOP,(@IN[iFLOW]*XFL_EN)=1
JP#ESTOP,@IN[iESTOP]=1
JP#ESTOP,(1-@IN[iDOOR])&DRFLAG=1
JP#ESTOP,(1-@IN[iDOOR])&@IN[iBYPASS]=1
JP#ESTOP,LL_ERR<>0;DOG=67
JP#ESTOP,VPNT0=1
JS#OSTOP,(OUTAC+@IN[FKEY1])=0;FPOWER=1;JP#SCAN
#OSTOP;CSTOP=1;EN
#FESTOP;FAN_ERR=1;JP#ESTOP

REM !!!! Auxiliary Error Routines (Thread 1) !!!!
#KEYMON;JP#KEYMON,MERR*(1-@IN[FKEY1])<>-1;KEY1=1;EN

REM !!!! Emergency Stop and Error Routine (Thread 0) !!!!
#ESTOP;ETIME=TIME;HX1;HX2;HX3
OP $EF,$FFFF,$FFFF,$FFFF,$FFFF
WT100;AB1;MO;KEY1=0;MEC=20
JS#SS_ER;ERX=30000;ERY=30000;ERZ=30000;MERR=0;TEACH=0;FPOWER=0;XQ#KEYMON,2
#ESTOP1;WT150;MEC=1;JP#S200,@IN[iESTOP]=1
MEC=3;JP#S200,(1-@IN[iDOOR])&@IN[iBYPASS]=1

```

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EXHIBIT 34

Software Code: Proprietary/irrelevant

540VA-1237


```
MEC=3;JP#S200,DRFLAG&(1-@IN[iDOOR])=1
MEC=4;JP#S210,LL_ERR=14;MEC=5;JP#S210,LL_ERR=39
MEC=6;JP#S198,FAN_ERR=1
MEC=7;JP#S199,VPNT0=1;JP#ESTOP2,POS_VAL=0
MEC=-1;JP#S208,KEY1=0;JS#FKEYREL;MERR=0
ERX=1000;ERY=1000;ERZ=1000;JS#DR_CLOS;PING=0;AP_OUT=1
MODE=0
HX1;HX2;ACFLAG=0;VLV=VSTORE;SB5;WT700;CS;SH;WT100;XQ#CS_MN1,1;JP#SCAN
#ESTOP2;MERR=-2;JS#S209;JS#WAIT_F1;HX1;HX2;ZS0;DP 0,0,0;JP#AUTO1
```

REM !!!! Command Error Routine (Thread 0) !!!!

```
#CMDERR;HX1;HX2;HX3;ST;AM;MO
  OP $EF,$FFFF,$FFFF,$FFFF,$FFFF
  SH;TEACH=0;FPOWER=0;ERR=_TC;MEC=11
  LINE=_ED;MERR=11;JS#SS_ER;JP#GSERR,SDE=41;JP#RESET,INIT*ERR=9
  JP#RESET,INIT*ERR=83;JS#S201;JS#FKEYREL;JS#ER_WT;HX1;JP#AUTO1
#GSERR;JS#S206,HX
```

REM !!!! Position Error Routine (Thread 0) !!!!

```
#POSERR;HX1;HX2;HX3;JS#S202;ST;AM;MO
  OP $EF,$FFFF,$FFFF,$FFFF,$FFFF
  TEACH=0;POS_VAL=0;FPOWER=0
  MEC=12;MERR=12;JS#SS_ER;JS#FKEYREL;JS#ER_WT
  HX1;ZS0;DP 0,0,0;JP#AUTO1
```

REM !!!! Limit Error Routine (Thread 0) !!!!

```
#LIMSWI;TEACH=0;JP#LS_HOME,HOMING=1;POS_VAL=0;HX1;HX2;HX3;JS#S203;ST;AM;MO
  MEC=13;MERR=13;JS#SS_ER;FPOWER=0
  OP $EF,$FFFF,$FFFF,$FFFF,$FFFF
  JS#FKEYREL
  JS#ER_WT;HX1;ZS0;DP 0,0,0;JP#AUTO1
#LS_HOME;RE
```

REM !!!! Startup Delay for Fan !!!!

```
#FAN_WT;HX1;FAN_WT=60000
  FAN_INC=1000;JS#S159;WT2000;JP#FAN_ER,@IN[iFLOW]=1;JS#S160
#FAN_WT1;WT FAN_INC;JS#S161;FAN_WT=(FAN_WT-FAN_INC)
  JP#FAN_ER,@IN[iFLOW]=1;JP#FAN_WT1,FAN_WT>0,FAN_ERR=0,FANPASS=1;EN
#FAN_ER;ZS1;FAN_ERR=1;FANPASS=0;JP#ESTOP
```

REM !!!! Machine Error Subroutines (Thread 0) !!!!

```
#ER_WT;JP#NOOP,@IN[FKEY1]=0;JP#ER_ST,@IN[FKEY5]=0;JP#ER_WT
#ER_ST;JS#FKEYREL;JS#SS_MN;JS#ER_SC;JP#ER_WT
#ER_SC;JS#FKEYREL;JS#S201,MERR=11;JS#S202,MERR=12;JS#S203,MERR=13;EN
```

REM !!!! Pre-Start Routines !!!!

```
#PRE_CHK;JS#INIT;JS#FAN_WT,((1-FANPASS)*XFL_EN)=1;JS#SF_MN,PASSED=0;SB5
  JP#PRE_HM,POS_VAL=0;ACM_ER=(@ABS[_TEX]+@ABS[_TEY]+@ABS[_TEZ])
  JP#PRE_HM,ACM_ER>800;XQ#CS_MN1,1;EN
#PRE_HM;POS_VAL=0;XQ#CS_MN,1;EN
```

REM !!!! Start-up Safety Check (Thread 0) !!!!

```
#SF_MN;MO;CHECK=0;VFAIL=0
  JS#CLS;JS#L1;MG{P2}{N}"Machine Safety Check"
```



```

VESPP=1;VDSPP=1;JS#L2;MG{P2}{N}"Press F1 to initiate."
JS#WAIT_F1
#SF_LP;JP#SF_FE,VFAIL=1;JP#SF_FD,VFAIL=2;JP#SF_FP,VFAIL=5
JP#SF_NE,@IN[iESTOP]=1;JP#SF_ND,@IN[iDOOR]=0;JP#SF_NK,@IN[iBYPASS]=0
JP#SF_CP,CHECK=0;JP#SF_CE,CHECK=1;JP#SF_CD,CHECK=2;PASSED=1;EN

#SF_NE;JS#CLS;JS#L1;MG{P2}{N}"Undo the EStop button.";CKSEN=iESTOP
JS#S_ZERO;JP#SF_LP
#SF_ND;JS#CLS;JS#L1;MG{P2}{N}"Close the door.";CKSEN=iDOOR
JS#S_ONE;JP#SF_LP
#SF_NK;JS#CLS;JS#L1;MG{P2}{N}"Turn the Door Bypass key to OFF";CKSEN=iBYPASS
JS#S_ONE;JP#SF_LP
#SF_CP;CB5;VCHECK=iPOWER;VSTATE=0;VFAIL=5;JS#SF_DD;JP#SF_LP,VFAIL<0;SB5
VFAIL=5;VSTATE=1;JS#SF_DD;CHECK=1;JP#SF_LP
#SF_CE;VCHECK=iESTOP;JS#CLS;JS#L1;MG{P2}{N}"Press the EStop button.";VESPP=1
VSTATE=1;VFAIL=1;JS#SF_DD;JP#SF_LP,VFAIL<0;VCHECK=iPOWER;VSTATE=0;VFAIL=5
VESPP=0;JS#SF_DD;VESPP=1;CHECK=2;JP#SF_LP
#SF_CD;VCHECK=iDOOR;JS#CLS;JS#L1;MG{P2}{N}"Open the door.";VDSPP=1
VSTATE=0;VFAIL=2;JS#SF_DD;JP#SF_LP,VFAIL<0;VCHECK=iPOWER;VSTATE=0;VFAIL=5
VDSPP=0;JS#SF_DD;VDSPP=1;CHECK=3;JP#SF_LP
#SF_DD;SFTMR=TIME;WT500
#SF_DD1;JP#SF_DD2,(VFAIL-1)*(@IN[iESTOP])*VESPP<0
JP#SF_DD2,(VFAIL-2)*(1-@IN[iDOOR])*VDSPP<0
JP#SF_DD2,@IN[iBYPASS]=0
JP#NOOP,(TIME-SFTMR)>8000;JP#SF_DD1,@IN[VCHECK]<VSTATE;VFAIL=0;EN
#SF_DD2;ZS1;VFAIL=0;JP#SF_LP
#SF_FP;CB5;JS#CLS;JS#L1;MG{P2}{N}"Power check failed.";JP#SF_FAIL
#SF_FE;JS#CLS;JS#L1;MG{P2}{N}"EStop button failed.";JP#SF_FAIL
#SF_FD;JS#CLS;JS#L1;MG{P2}{N}"Door safety failed.";JP#SF_FAIL
#SF_FAIL;JP#SF_OVER,SAFE<0;JS#L2;MG{P2}{N}"Press F1 to repeat test."
JS#WAIT_F1;SAFE=1;JP#SF_MN
#SF_OVER;JS#L2;MG{P2}{N}"Repair and restart machine.";ZS0;HX

REM !!!! Program Status Report (Thread 0 or 1) !!!!
#SS_MN;JS#CLS
JS#L1;MG{P2}{N}"Machine Status Report. Press ";MG{P2}{N}"F1 to "
JS#L2;MG{P2}{N}"scroll through screens or F8 t";MG{P2}{N}"o quit. "
JS#SS_LP

JS#CLS;JS#L1;MG{P2}{N}"X-axis Enc.Pos. Com.Pos. P"
MG{P2}{N}"os.Err. "
JS#L2;MG{P2}{N}"      ",{F6.0}_TPX," ",{F6.0}_RPX," ",{F6.0}_TEX
JS#SS_LP

JS#CLS
JS#L1;MG{P2}{N}"Y-axis Enc.Pos. Com.Pos. P";MG{P2}{N}"os.Err. "
JS#L2;MG{P2}{N}"      ",{F6.0}_TPY," ",{F6.0}_RPY," ",{F6.0}_TEY
JS#SS_LP

JS#CLS
JS#L1;MG{P2}{N}"Z-axis Enc.Pos. Com.Pos. P";MG{P2}{N}"os.Err. "
JS#L2;MG{P2}{N}"      ",{F6.0}_TPZ," ",{F6.0}_RPZ," ",{F6.0}_TEZ
JS#SS_LP

```

JS#CLS;N1=_MOX;JS#L1;MG{P2}{N}"X-axis Motors On/Off Torque"
MG{P2}{N}" Tor.Lim.";JS#L2;MG{P2}{N}" ",HLW[N1]{S3}
MG{P2}{N}" ",{F1.4}_TTX," ",{F1.4}_TLX
JS#SS_LP

JS#CLS;N1=_MOY;JS#L1;MG{P2}{N}"Y-axis Motors On/Off Torque"
MG{P2}{N}" Tor.Lim.";JS#L2;MG{P2}{N}" ",HLW[N1]{S3}
MG{P2}{N}" ",{F1.4}_TTY," ",{F1.4}_TLY
JS#SS_LP

JS#CLS;N1=_MOZ;JS#L1;MG{P2}{N}"Z-axis Motors On/Off Torque"
MG{P2}{N}" Tor.Lim.";JS#L2;MG{P2}{N}" ",HLW[N1]{S3}
MG{P2}{N}" ",{F1.4}_TTZ," ",{F1.4}_TLZ
JS#SS_LP

JS#CLS;N1=_HMX;N2=_LFX;N3=_LRX
JS#L1;MG{P2}{N}"X-axis Sensors Home For.Lim.";MG{P2}{N}" Rev.Lim."
JS#L2;MG{P2}{N}" ",HLW[N1]{S3}," ",HLW[N2]{S3}
MG{P2}{N}" ",HLW[N3]{S3}
JS#SS_LP

JS#CLS;N1=_HMY;N2=_LFY;N3=_LRY
JS#L1;MG{P2}{N}"Y-axis Sensors Home For.Lim.";MG{P2}{N}" Rev.Lim."
JS#L2;MG{P2}{N}" ",HLW[N1]{S3}," ",HLW[N2]{S3}
MG{P2}{N}" ",HLW[N3]{S3}
JS#SS_LP

JS#CLS;N1=_HMZ;N2=_LFZ;N3=_LRZ
JS#L1;MG{P2}{N}"Z-axis Sensors Home For.Lim.";MG{P2}{N}" Rev.Lim."
JS#L2;MG{P2}{N}" ",HLW[N1]{S3}," ",HLW[N2]{S3}
MG{P2}{N}" ",HLW[N3]{S3}
JS#SS_LP

JS#CLS
JS#L1;MG{P2}{N}"X-axis Tuning KD KP ";MG{P2}{N}" KI "
JS#L2;MG{P2}{N}" ",{F3.2}_KDX," ",{F3.2}_KPX," ",{F3.2}_KIX
JS#SS_LP

JS#CLS
JS#L1;MG{P2}{N}"Y-axis Tuning KD KP ";MG{P2}{N}" KI "
JS#L2;MG{P2}{N}" ",{F3.2}_KDY," ",{F3.2}_KPY," ",{F3.2}_KIY
JS#SS_LP

JS#CLS
JS#L1;MG{P2}{N}"Z-axis Tuning KD KP ";MG{P2}{N}" KI "
JS#L2;MG{P2}{N}" ",{F3.2}_KDZ," ",{F3.2}_KPZ," ",{F3.2}_KIZ
JS#SS_LP;EN

#SS_LP;JP#WAIT_F1,@IN[FKEY1]=0;JP#SS_LP1,@IN[FKEY8]=0;JP#SS_LP
#SS_LP1;ZS1;JS#FKEYREL;EN
#SS_ER;JP#NOOP.REPORT=0;MG;MG"Error Cause: "{N};MG HLW[MEC]{S}
MG"E-Stop:"{N};MG@IN[iESTOP]{F1.0}
MG"Door:"{N};MG@IN[iDOOR]{F1.0}

```
MG"Door Bypass:"{N};MG@IN[iBYPASS]{F1.0}
MG"Exhaust Flow:"{N};MG@IN[iFLOW]{F1.0}
MG"Material A Level:"{N};MG@IN[iLEVELA]{F1.0}
MG"Material B Level:"{N};MG@IN[iLEVELB]{F1.0}
MG"Stop Codes (x,y,z)",MG_SCX{F3.0}{N};MG_SCY{F3.0}{N}
MG_SCZ{F3.0}{N}
MG"Current Error: "{N};TC1;MG"Error on line:",{F3.0}LINE
MG"Current Position (x,y,z)";TPXYZ{F6.0}
MG"Position Error (x,y,z)";TEXYZ{F6.0};EN
```

REM !!!! Initialization Routine (Thread 0) !!!!

```
#INIT;HX1;HX2;HX3;INIT=0;PMX=2;CO 14
OP $EF,$FFFF,$FFFF,$FFFF,$FFFF
CS;JS#INITLCD;JS#S001;WT2000;DA*[0];JS#FKEYREL
DM PT_SBY[4],PT_CAL[4],PT_APG[4],A_HEAD[5],AXIS[6],ASTRSK[4],HLW[30]
DM R_HEAD[5],OPF1[20],OPF2[20],OPF3[20],OPF4[20],ECOD1[10],ECOD2[10]
DM ECOD3[10],ECOD4[10],ECOD5[10],A2HEAD[5],PT_SOL[5]
ASTRSK[0]=" ";ASTRSK[1]="*";ASTRSK[2]="*";FPOWER=0;KEY1=0
ASTRSK[3]=" ";HLW[0]="ON ";HLW[1]="OFF";HLW[2]="OFF";HLW[3]="ON "
HLW[11]="ComErr";HLW[12]="PosErr";HLW[13]="LimErr";HLW[20]="I/O "
AXIS[1]="X&Y";AXIS[2]="X ";AXIS[3]="Y ";AXIS[4]="Z ";ERR=0;LINE=0;REPORT=0
AXIS[5]="W ";OUTAC=1;VLV=1;HOMING=1;VPNT0=0;SAFE=0;TEACH=0;MODE=0;ST_BY=0
AP_TE=0;AP_TP=TIME.ACFLAG=0;VSTORE=1;CAXIS=1;CHEAD=1;PLYBCK=0;FAN_ERR=0
PNEC=0;PING=0;ACINPT=0;VCLEAR=0;AP_OUT=1;FLSO_TM=TIME
DRFLAG=1;MERR=0;JS#GETASN;JS#IMACH;SDE=41;GS#IPROG;#EOM;SDE=0;JS#IPROG
LL_ERR=0;INIT=1;JP#INIT2,CPROG<=KNPROG;CPROG=1
#INIT2;JS#LPPROG;JS#CHECK;INIT=0;EN
```

REM !!!! Check Variables And Reset Routines (Thread 0) !!!!

```
#CHECK;JP#RESET,CPROG<1;JP#RESET,CPROG>KNPROG;JP#RESET,CCNT<0
JP#RESET,FANPASS<0;JP#RESET,POS_VAL<0
JP#RESET,FNF_EN<0
JP#RESET,FNF_TM<0
JP#RESET,FLUSH_TM<0
JP#RESET,FILL_TM<0
JP#RESET,SOLVENT<0
```

EN

```
#RESET;JS#S204;WT2000;JP#S205,TRY_RES=1;HX1;HX2;HX3
DA*,*[0];CCNT=0;CPROG=1;FANPASS=0;POS_VAL=0
FNF_EN=0
FNF_TM=1800000
FLUSH_TM=30000
FILL_TM=30000
SOLVENT=0
TRY_RES=1;PASSED=0;JS#S100;ZS0;JP#AUTO2
```

REM !!!! Load Program Routine (Thread 0) !!!!

```
#LPPROG;SDE=41;JP#LP2,CPROG>1;GS#PROG1,#PROG;JP#LX
#LP2;JP#LP4,CPROG>3;GS#PROG2,#PROG;JP#LX,CPROG=2;GS#PROG3,#PROG;JP#LX
#LP4;JP#LP6,CPROG>5;GS#PROG4,#PROG;JP#LX,CPROG=4;GS#PROG5,#PROG;JP#LX
#LP6;JP#LP8,CPROG>7;GS#PROG6,#PROG;JP#LX,CPROG=6;GS#PROG7,#PROG;JP#LX
#LP8;JP#LP10,CPROG>9;GS#PROG8,#PROG;JP#LX,CPROG=8;GS#PROG9,#PROG;JP#LX
#LP10;JP#LP12,CPROG>11;GS#PROG10,#PROG;JP#LX,CPROG=10;GS#PROG11,#PROG;JP#LX
#LP12;JP#LP14,CPROG>13;GS#PROG12,#PROG;JP#LX,CPROG=12;GS#PROG13,#PROG;JP#LX
```

```
#LP14;JP#LP16,CPROG>15;GS#PROG14,#PROG;JP#LX,CPROG=14;GS#PROG15,#PROG;JP#LX
#LP16;JP#LP18,CPROG>17;GS#PROG16,#PROG;JP#LX,CPROG=16;GS#PROG17,#PROG;JP#LX
#LP18;JP#LP20,CPROG>19;GS#PROG18,#PROG;JP#LX,CPROG=18;GS#PROG19,#PROG;JP#LX
#LP20;JP#LP22,CPROG>21;GS#PROG20,#PROG;JP#LX,CPROG=20;GS#PROG21,#PROG;JP#LX
#LP22;JP#LP24,CPROG>23;GS#PROG22,#PROG;JP#LX,CPROG=22;GS#PROG23,#PROG;JP#LX
#LP24;JP#LP26,CPROG>25;GS#PROG24,#PROG;JP#LX,CPROG=24;GS#PROG25,#PROG;JP#LX
#LP26;JP#LP28,CPROG>27;GS#PROG26,#PROG;JP#LX,CPROG=26;GS#PROG27,#PROG;JP#LX
#LP28;JP#LP30,CPROG>29;GS#PROG28,#PROG;JP#LX,CPROG=28;GS#PROG29,#PROG;JP#LX
#LP30;JP#LP32,CPROG>31;GS#PROG30,#PROG;JP#LX,CPROG=30;GS#PROG31,#PROG;JP#LX
#LP32;GS#PROG32,#PROG;JP#LX
#LX;SDE=0;EN
```

REM !!!! Home Routine (Thread 1) !!!!

```
#MV_HOME;JS#DR_CLOS;JS#S019;POS_VAL=0;HOMING=1
JS#TUNE;ST,AM
FL 200000,200000,200000
BL -200000,-200000,-200000
AC 150000,150000,150000/SCALE_Z
DC 150000,150000,150000/SCALE_Z
OE 1,1,1;JS#ALLUP;ERX=1000;ERY=1000;ERZ=1000;SH
FEZ;SPZ=30000/SCALE_Z;BGZ;AMZ;PR,,1500;BGZ;AMZ
FEZ;SPZ=2000/SCALE_Z;BGZ;AMZ;PR,,1000;SPZ=20000/SCALE_Z;BGZ;AMZ;DPZ=0
FLZ=30000,BLZ=-3000
FEXY;SP 10000,10000;BGXY;AMXY;PR 3000,3000;SP 500,500;BGXY;AMXY
FEXY;SP 500,500;BGXY;AMXY;PR 3000,3000;SP 2000,2000;BGXY;AMXY
DP 0,-703;JS#TUNE;POS_VAL=1;HOMING=0;EN
```

REM !!!! Move To Stand-By Routine (Thread 1) !!!!

```
#MV_SBY;JS#DR_CLOS;JS#ALLUP;SP 60000,60000,100000/SCALE_Z
AC 150000,150000,150000/SCALE_Z;DC 150000,150000,150000/SCALE_Z
SH;DELTAS=@ABS[_TPX-PT_SBY[0]]+@ABS[_TPY-PT_SBY[1]]+@ABS[_TPZ-PT_SBY[2]]
JS#SAFEZ,DELTAS>10
PA PT_SBY[0],PT_SBY[1],PT_SBY[2];BGXY;AMXY;BGZ;AMZ
JS#TUNE;ST_BY=1;EN
```

REM !!!! Flush/Fill Main Screen !!!!

```
#SOFL_MN
JS#FKEYREL
FNF_FLAG=0
JS#S006
AC 100000,100000,100000
DC 50000,50000,50000
SP 50000,50000,100000/SCALE_Z
JS#DR_CLOS;JS#SAFEZ;PA PT_APG[0],PT_APG[1],PT_APG[2];BGXY;AMXY
BGZ;AMZ;'JS#H1DW;'JS#H2DW;'JS#H3DW
#SOFL_LP
JP#SOFLEND,@IN[FKEY1]=0
JP#SO_FLSH,@IN[FKEY3]=0
JP#MAT_FIL,@IN[FKEY4]=0
JP#SO_FNF,@IN[FKEY6]=0
IF (FNF_FLAG=1)
FNF_FLAG=0
ENDIF
JP#SOFL_LP
```

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Software Code: Proprietary/irrelevant

```
#SOFLEND
JS#FKEYREL
JP#CS_MN1

#SO_FLSH
JS#S007
JS#SOLV
WT1500
JS#H1VLON;JS#H2VLON;JS#H3VLON
TEMP_TM=TIME
#WT_FLSH
JP#ABRTSF,(((IN[FKEY1]=0)&(ACFLAG=0))
JP#WT_FLSH,((TIME-TEMP_TM)<FLUSH_TM)
#ABRTSF2
JS#H1VLOF;JS#H2VLOF;JS#H3VLOF
JS#S006,ACFLAG=0
JP#SOFL_LP,((FNF_FLAG=0)&(ACFLAG=0))
```

```
#MAT_FIL
JS#S008
JS#MATV
WT1500
JS#H1VLON;JS#H2VLON;JS#H3VLON
TEMP_TM=TIME
#WT_FILL
JP#ABRTMF,(((IN[FKEY1]=0)&(ACFLAG=0))
JP#WT_FILL,((TIME-TEMP_TM)<FILL_TM)
#ABRTMF2
JS#H1VLOF;JS#H2VLOF;JS#H3VLOF
JS#S006,ACFLAG=0
JS#FKEYREL
FNF_FLAG=0
JP#SOFL_LP,(ACFLAG=0)
EN
```

```
#ABRTSF
JP#ABRTSF,(@IN[FKEY1]=0)
FNF_FLAG=0
JP#ABRTSF2
```

```
#ABRTMF
JP#ABRTMF,(@IN[FKEY1]=0)
JP#ABRTMF2
```

```
#SO_FNF
FNF_FLAG=1
JP#SO_FLSH
```

```
#AC_FNF
JP#AC_FNF,_XQ2>0
JS#ALLUP
JS#SAFEZ
AC 100000,100000,100000
```

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EXHIBIT 34
Software Code: Proprietary/irrelevant


```
DC 50000,50000,50000
SP 50000,50000,100000/SCALE_Z
JS#DR_CLOS;JS#SAFEZ;PA PT_APG[0],PT_APG[1],PT_APG[2];BGXY;AMXY
BGZ;AMZ;'JS#H1DW;'JS#H2DW;'JS#H3DW

FNF_FLAG=0
IF (@OUT[oSOLV]=1)
  JS#SO_FLSH
ELSE
  JS#MAT_FIL
ENDIF
JS#S020
FLSO_TM=TIME
SOL_TM=TIME
JS#ALLUP
JS#SAFEZ
JS#MV_SBY
EN

REM !!!! Move To Solvent Cup Routine (Thread 1) !!!!
#MV_SOL;JS#DR_CLOS;SP 100000,100000,100000/SCALE_Z
AC 200000,200000,200000/SCALE_Z;DC 200000,200000,200000/SCALE_Z
SH;DELTAS=@ABS[_TPX-PT_SOL[0]]+@ABS[_TPY-PT_SOL[1]]+@ABS[_TPZ-PT_SOL[2]]
JS#S039,DELTAS>10;JS#SAFEZ,DELTAS>10
PA PT_SOL[0],PT_SOL[1],PT_SOL[2];BGXY;AMXY;BGZ;AMZ
JS#H1DW;JS#H2DW;JS#H3DW;JS#TUNE;ST_BY=0;EN

REM !!!! Cyclestop Routine (Thread 1) !!!!
#CS_MN;JP#CS_MN,FPOWER=0;JS#S002;JS#WAIT_F1;JS#MV_HOME
#CS_MN1;JS#ALLUP;JP#CS_MN1,FPOWER=0;JP#CS_MN,POS_VAL=0;JS#MV_SOL,SO_EN=1
JS#MV_SBY,SO_EN=0;CSTOP=0;ACFLAG=0

IF (SOLVENT=1)
  JS#SOLV
ELSE
  JS#MATV
ENDIF

WT400;JS#S003;JS#FKEYREL
#CS_LP;JP#PG_MN,@IN[FKEY1]=0
JP#SOFL_MN,@IN[FKEY2]=0
JP#CA_MN,@IN[FKEY3]=0
JP#MA_MN,@IN[FKEY4]=0;JP#AC_MN,@IN[FKEY5]=0;JP#ST_MN,@IN[FKEY6]=0
JP#SU_MN,@IN[FKEY8]=0
JS#CS_AP,(AP_TE*AP_OUT*(1-SO_EN))>AP_TIME;JP#CS_LP
#CS_AP;XQ#A_PURGE,2
#CS_API;JP#CS_API,PING=1;JS#S003;EN

REM !!!! Program Selection (Thread 1) !!!!
#PG_MN;JS#S004
#PG_MN1;JS#S005;JS#FKEYREL
#PG_LP;JP#PG_BV,@IN[FKEY1]=0
JP#PG_DW,@IN[FKEY2]=0;JP#PG_UP,@IN[FKEY3]=0;JP#PG_LP
#PG_BV;JS#S100;JS#LPPROG;JS#FKEYREL;JP#CS_MN1
```

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EXHIBIT 34

Software Code: Proprietary/irrelevant

547 PVA-1244

```
#PG_DW;CPRG=CPRG-1;JP#PG_MN1,CPRG>0;CPRG=KNPRG;JP#PG_MN1
#PG_UP;CPRG=CPRG+1;JP#PG_MN1,CPRG-1<KNPRG;CPRG=1;JP#PG_MN1
```

REM !!!! Teach Routines (Thread 1) !!!!

```
#TE_F2;KEY=22*TEACH;JP#TE_FA,RKEY=53;JP#TE_FA,(TIME-TETIME)>1000;JP#TE_F2
#TE_FA;JP#TE_FB,RKEY=53;KEY=0;RKEY=0;JS#FKEYREL;JS#TKEYREL;EN
#TE_FB;CB6;WT50;SB6;KEY=0;WT100;RKEY=0;JS#FKEYREL;JS#TKEYREL;EN
#TE_PB;HX2;HX3;ST;AM;JS#S076;KEY=44*TEACH;WT2000;KEY=0;JP#MA_MN1
#TE_RS;HX0;WT100;XQ#SCAN;0;JS#DR_CLOS;TEACH=0;KEY=0;PASSED=1
    SP 60000,60000,100000/SCALE_Z
    JP#TE_RS1,PMX>1;PAZ=0;BGZ;AMZ
#TE_RS1;CS;XQ#PROG;2;PLYBCK=0
#TE_RS2;JP#TE_RS2,_XQ2>0;ST;AM;JP#MA_MN1
```

REM !!!! Calibration Routine (Thread 1) !!!!

```
#CA_MN;JS#S009;JS#ALLUP;JS#FKEYREL
    SP 30000,30000,60000/SCALE_Z
    AC 100000,100000,100000/SCALE_Z
    DC 50000,50000,50000/SCALE_Z;JS#SAFEZ
    PA PT_CAL[0],PT_CAL[1],PT_CAL[2];BGXY,AMXY
    BGZ;AMZ;JS#H2DW;DRFLAG=0
#CA_LP;JP#CS_MN1,@IN[FKEY1]=0;JP#CA_HOME,@IN[FKEY3]=0;JP#CA_LP
#CA_HOME;JS#MV_HOME;JP#CA_MN
```

REM !!!! Manual Mode Functions (Thread 1) !!!!

```
#MA_MN
    JS#FKEYREL
REM !!!! Warn if Solvent in Lines !!!
    IF (@OUT[oSOLV]=0)
        JS#S013
        #SO_WRN2
        JP#CS_MN1,@IN[FKEY1]=0
        JP#IGNWRN2,@IN[FKEY2]=0
        JP#SO_WRN2
    #IGNWRN2
    JS#FKEYREL
    ENDIF
    JS#MV_SBY
#MA_MN1;DRFLAG=0;CTM=0;TEACH=1;KEY=0;PLYBCK=0;RKEY=0
    CAXIS=1;JS#S010;JS#FKEYREL;HX2;XQ#TB_XY,2;MODE=1
#MA_LP;JP#MA_END,@IN[FKEY1]=0;TETIME=TIME;JS#TE_F2,@IN[FKEY2]=0
    JS#VV_MN,@IN[FKEY3]=0;JP#OS_MN,@IN[FKEY4]=0;JS#PR_MN,@IN[FKEY5]=0
    JS#TP_MN,@IN[FKEY6]=0;JS#AX_MN,@IN[FKEY8]=0;JP#TE_PB,PLYBCK=1
    JS#RM_TCH,(@IN[iTEACH]+@IN[iPURGE]+@IN[iAXIS])<3;JP#MA_LP
#MA_END;JS#LED_RS;TEACH=0;JS#FKEYREL;HX2;ST;AM;VLV=VSTORE
    MODE=0;JS#DR_CLOS;JS#ALLUP;JP#CS_MN1
```

REM !!!! Valve Function Routines (Thread 1) !!!!

```
#VV_MN;JS#S016;JS#FKEYREL;MODE=3
#VV_LP;JP#VV_END,@IN[FKEY1]=0;JS#PR_MN,@IN[FKEY2]=0;JS#VV_SEL,@IN[FKEY3]=0
    JS#VV_UP,@IN[FKEY4]=0;JS#VV_DW,@IN[FKEY5]=0;JS#VV_RA,@IN[FKEY6]=0
    JS#VV_RB,@IN[FKEY7]=0;JP#NOOP,PLYBCK=1
    JS#RM_TCH,(@IN[iTEACH]+@IN[iPURGE]+@IN[iAXIS])<3;JP#VV_LP
#VV_END;JS#S010;JS#FKEYREL;MODE=1;EN
```



```
#VV_SEL;CHEAD=CHEAD+1;JP#VV_SEL1,CHEAD-1<KNHEAD;CHEAD=1
#VV_SEL1;JS#FKEYREL;JS#S012;JS#S017;EN
#VV_UP;JS#H1UP,CHEAD=1;JS#H2UP,CHEAD=2;JS#H3UP,CHEAD=3;JS#FKEYREL;EN
#VV_DW;JS#H1DW,CHEAD=1;JS#H2DW,CHEAD=2;JS#H3DW,CHEAD=3;JS#FKEYREL;EN
#VV_RA;JS#H1RA,CHEAD=1;JS#H2RA,CHEAD=2;JS#H3RA,CHEAD=3;JS#FKEYREL;EN
#VV_RB;JS#H1RB,CHEAD=1;JS#H2RB,CHEAD=2;JS#H3RB,CHEAD=3;JS#FKEYREL;EN

REM !!!! One-Shot Routine (Thread 1) !!!!
#OS_MN;ST;AM;HX2;TEACH=0;WT200;ACFLAG=1;JS#MV_SBY;ACFLAG=0;DRFLAG=0
JS#LPPROG;JS#S022;CTM=0;JS#FKEYREL
#OS_LP;JP#MA_MN,@IN[FKEY1]=0;JP#OS_RUNW,@IN[FKEY2]=0
JP#OS_RUND,@IN[FKEY3]=0;JP#OS_LP
#OS_RUN;JS#AC_LL,VLV=1;JS#DR_CLOS;CTM=0;JS#S021
JS#FKEYREL;CS;CTM=TIME;XQ#PROG,2
#OS_RUN1;JP#OS_RUN1,XQ2>0;ACFLAG=1;JS#MV_SBY;ACFLAG=0;CTM=TIME-CTM
#OS_RUN2;CCNT=CCNT+1;JP#OS_MN
#OS_RUNW;VLV=1;JP#OS_RUN
#OS_RUND;VLV=0;JP#OS_RUN

REM !!!! Manual Purge (Thread 1) !!!!
#PR_MN;VLV=1;JS#H1VLON,CHEAD=1;JS#H2VLON,CHEAD=2;JS#H3VLON,CHEAD=3
JS#FKEYREL;JS#TKEYREL;JS#H1VLOF,CHEAD=1;JS#H2VLOF,CHEAD=2;JS#H3VLOF,CHEAD=3;EN

REM !!!! Tell Position Routine (Thread 1) !!!!
#TP_MN;JS#CLS;JS#S041;JS#FKEYREL;JS#S010;EN

REM !!!! Select Axis Routines (Thread 1) !!!!
#AX_MN;JS#S015;JS#FKEYREL;MODE=2
#AX_LP;JP#AX_END,@IN[FKEY1]=0;TETIME=TIME;JS#TE_F2,@IN[FKEY2]=0
JS#PR_MN,@IN[FKEY3]=0;JS#AX_XY,@IN[FKEY4]=0;JS#AX_X,@IN[FKEY5]=0
JS#AX_Y,@IN[FKEY6]=0;JS#AX_Z,@IN[FKEY7]=0;JP#NOOP,PLYBCK=1
JS#RM_TCH,@IN[iTEACH]+@IN[iPURGE]-@IN[iAXIS]<3;JP#AX_LP
#AX_END;JS#FKEYREL;JS#S010;MODE=1;EN
#AX_XY;CAXIS=1;JS#AX_SCR;JS#LED_XY;SX=FSTX;SY=FSTY;SZ=0;JP#AX_DN
#AX_X;CAXIS=2;JS#AX_SCR;JS#LED_X;SY=0;SX=FSTX;SZ=0;JP#AX_DN
#AX_Y;CAXIS=3;JS#AX_SCR;JS#LED_Y;SX=0;SY=FSTY;SZ=0;JP#AX_DN
#AX_Z;CAXIS=4;JS#AX_SCR;JS#LED_Z;SX=0;SY=0;SZ=FSTZ;JP#AX_DN
#AX_SCR;JS#S011,MODE=2;JS#S011B,MODE=1;EN
#AX_DN;JS#FKEYREL;JS#TKEYREL;EN

REM !!!! Auto Cycle Routines (Thread 1) !!!!
#AC_MN
JS#FKEYREL
JS#AC_LL,VLV=1
REM !!!! Warn if Solvent in Lines !!!
IF (@OUT[oSOLV]=0)
JS#S013
#SO_WRN
JP#CS_MN1,@IN[FKEY1]=0
JP#IGN_WRN,@IN[FKEY2]=0
JP#SO_WRN
#IGN_WRN
ENDIF
JS#FKEYREL
```

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EXHIBIT 34
Software Code: Proprietary/irrelevant

549 VA-1246

```
ACFLAG=1
JS#LPPROG;CTM=0;JS#A_PURGE,SO_EN=1
JP#AC_MN1,@IN[iSTART]=1;FLSO_TM=TIME;JS#S045
#AC_MNX;JP#AC_MNX,@IN[iSTART]=0
#AC_MN1;SOL_TM=TIME;JS#S020;JS#FKEYREL
#AC_LP
JP#AC_END,@IN[FKEY1]=0
JS#AC_LL,VLV=1
JS#AC_DR,_XQ2<0
JS#AC_SO,((TIME-SOL_TM)*ST_BY*SO_EN)>SLP_TM
JP#AC_S,@IN[iSTART]=0
JS#AC_AP,(AP_TE*AP_OUT*(1-SO_EN))>AP_TIME
JS#AC_FNF,(((TIME-FLSO_TM)*FNF_EN)>FNF_TM)
JP#AC_LP
#AC_END;JP#AC_END,PING=1;JS#S100;ACFLAG=0;JP#CS_MN1
#AC_S;JP#AC_S1,ST_BY=1;XQ#A_PURGE,2
#AC_S1;JS#DR_CLOS;JP#AC_S1,PING=1;CTM=0;CS;JS#S021;JS#FKEYREL
CTM=TIME;XQ#PROG,2
#AC_2;JP#AC_2,_XQ2>0;JP#AC_2,@IN[iSTART]=0
CCNT=CCNT+1;JS#MV_SBY;CTM=TIME-CTM;DRFLAG=0;JP#AC_MN1
#AC_AP;JP#NOOP,PING=1;JS#A_PURGE;JS#S020;EN
#AC_DR;DRFLAG=0;EN
#AC_LL;LL_VAR=14;JP#AC_LLE,@IN[iLEVELA]&LLA_EN=1;LL_VAR=39
JP#AC_LLE,@IN[iLEVELB]&LLB_EN=1;EN
#AC_LLE;LL_ERR=LL_VAR;WT999;EN
```

REM !!!! Move to Solvent Cups !!!!

```
#AC_SO;JS#ALLUP;JP#AC_SO,_XQ2>0;JS#MV_SOL;JS#S020;EN
```

REM !!!! Status Routines (Thread 1) !!!!

```
#ST_MN;JS#S024
#ST_LP;JP#ST_END,@IN[FKEY1]=0;JP#ST_SS,@IN[FKEY3]=0;JP#ST_LP
#ST_END;JP#CS_MN1
#ST_SS;JS#SS_MN;JP#ST_MN
```

REM !!!! Setup Routines (Thread 1) !!!!

```
#SU_MN;JS#S030;JS#SU_SCR
#SU_LP;JP#SU_END,@IN[FKEY1]=0
JP#SU_CNT,@IN[FKEY2]=0;JP#SU_CRS,@IN[FKEY3]=0
JP#SFMF_SU,@IN[FKEY4]=0
JS#SU_APON,@IN[FKEY5]=0;JS#SU_APOF,@IN[FKEY6]=0
JS#SU_WET,@IN[FKEY7]=0;JS#SU_DRY,@IN[FKEY8]=0;JP#SU_LP
#SU_END;JS#FKEYREL;JS#S100;VLV=VSTORE;JP#CS_MN1
#SU_CNT;JS#S031;JS#FKEYREL;JP#SU_MN
#SU_CRS;CCNT=0;JS#S100;JP#SU_MN
#SU_APON;AP_EN=1;JP#SU_SCR
#SU_APOF;AP_EN=0;JP#SU_SCR
#SU_WET;VSTORE=1;JP#SU_SCR
#SU_DRY;VSTORE=0
#SU_SCR;JS#FKEYREL;LCD1=AP_EN;LCD3=VSTORE;JS#S025;EN
```

REM !!!! Solvent Flush/Material Fill Setup Options !!!!

```
#SFMF_SU
```

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JS#FKEYREL
JS#S0301
JS#S0301A
JS#S0301B

#SFMF_LP
JP#SFMFEND,(@IN[FKEY1]=0)
JP#ACSF_MN,(@IN[FKEY3]=0)
JS#SF_UP,(@IN[FKEY5]=0)
JS#SF_DW,(@IN[FKEY6]=0)
JS#MF_UP,(@IN[FKEY7]=0)
JS#MF_DW,(@IN[FKEY8]=0)
JP#SFMF_LP
EN

#SF_UP
STP_TM=TIME;STEP=1000
#SF_UP1
FLUSH_TM=FLUSH_TM+STEP;JS#SF_RS1,FLUSH_TM>MAX_FLSH;JS#S0301A;WT75
JS#STEP_C,(TIME-STP_TM)>2500;JP#SF_UP1,@IN[FKEY5]=0
EN

#SF_DW
STP_TM=TIME;STEP=1000
#SF_DW1
FLUSH_TM=FLUSH_TM-STEP;JS#SF_RS0,FLUSH_TM<MIN_FLSH;JS#S0301A;WT75
JS#STEP_C,(TIME-STP_TM)>2500;JP#SF_DW1,@IN[FKEY6]=0
EN

#MF_UP
STP_TM=TIME;STEP=1000
#MF_UP1
FILL_TM=FILL_TM+STEP;JS#MF_RS1,FILL_TM>MAX_FILL;JS#S0301B;WT75
JS#STEP_C,(TIME-STP_TM)>2500;JP#MF_UP1,@IN[FKEY6]=0
EN

#MF_DW
STP_TM=TIME;STEP=1000
#MF_DW1
FILL_TM=FILL_TM-STEP;JS#MF_RS0,FILL_TM<MIN_FILL;JS#S0301B;WT75
JS#STEP_C,(TIME-STP_TM)>2500;JP#MF_DW1,@IN[FKEY7]=0
EN

#SFMFEND
JP#SFMFEND,@IN[FKEY1]=0
JP#SU_MN

#S0301;JS#CLS
JS#L1;MG{P2}{N}"F&F: AUTO Flsh s. Fil s."
JS#L2;MG{P2}{N}"EXIT OPT UP DW UP DW ";EN

#S0301A;MG{P2}{N}{^17},{^25},{^150},{^18},{(FLUSH_TM/1000)}{F3.0};EN

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#S0301B;MG{P2}{N}{^17},{^25},{^161},{^18},{(FILL_TM/1000)}{F3.0};EN

#SF_RS1;FLUSH_TM=MIN_FLSH;STP_TM=TIME;EN
 #SF_RS0;FLUSH_TM=MAX_FLSH;STP_TM=TIME;EN
 #MF_RS1;FILL_TM=MIN_FILL;STP_TM=TIME;EN
 #MF_RS0;FILL_TM=MAX_FILL;STP_TM=TIME;EN
 #STEP_C;STEP=STEP*5;STP_TM=TIME;EN
 #STEP_D;STEP=STEP*10;STP_TM=TIME;EN

REM !!!!Auto Cycle Solvent Flush Options!!!

#ACSF_MN

JS#FKEYREL

JS#S0302

JS#S0302A

JS#S0302B

#ACSF_LP

JP#SFMF_SU,(@IN[FKEY1]=0)

JS#FNF_ON,@IN[FKEY3]=0

JS#FNF_OF,@IN[FKEY4]=0

JS#FNF_UP,(@IN[FKEY5]=0)

JS#FNF_DW,(@IN[FKEY6]=0)

JP#ACSF_LP

#FNF_UP

STP_TM=TIME;STEP=60000

#FNF_UP1

FNF_TM=FNF_TM+STEP;JS#FNF_RS1,FNF_TM>MAX_FNF;JS#S0302A;WT75

JS#STEP_D,(TIME-STP_TM)>2500;JP#FNF_UP1,@IN[FKEY5]=0

EN

#FNF_DW

STP_TM=TIME;STEP=60000

#FNF_DW1

FNF_TM=FNF_TM-STEP;JS#FNF_RS0,FNF_TM<MIN_FNF;JS#S0302A;WT75

JS#STEP_D,(TIME-STP_TM)>2500;JP#FNF_DW1,@IN[FKEY6]=0

EN

#S0302;JS#CLS

JS#L1;MG{P2}{N}"Auto Opt: F&F Freq min "

JS#L2;MG{P2}{N}"EXIT ON OFF UP DW ";EN

#S0302A

MG{P2}{N}{^17},{^25},{^151},{^18},{(FNF_TM/60000)}{F3.0}

EN

#S0302B

MG{P2}{N}{^17},{^25},{^202},{^18},ASTRSK[FNF_EN]{S}

MG{P2}{N}{^17},{^25},{^206},{^18},ASTRSK[FNF_EN+2]{S};EN

#FNF_ON;FNF_EN=1;JS#S0302B;JS#FKEYREL;EN

#FNF_OF;FNF_EN=0;JS#S0302B;JS#FKEYREL;EN

#FNF_RS1;FNF_TM=MIN_FNF;STP_TM=TIME;EN

#FNF_RS0;FNF_TM=MAX_FNF;STP_TM=TIME;EN

REM !!!! Auto Purge (Thread 2) !!!!

#A_PURGE

AP_OUT=0;PING=1;VLV=1;JS#S040

AC 100000,100000,100000

DC 50000,50000,50000

SP 50000,50000,100000/SCALE_Z

JS#DR_CLOS;JS#SAFEZ;PA PT_APG[0],PT_APG[1],PT_APG[2];BGXY;AMXY

BGZ;AMZ;JS#H1DW;JS#H2DW;JS#H3DW;JS#H1VLON;JS#H2VLON;JS#H3VLON;WT AP_LEN

JS#H1VLOF;JS#H2VLOF;JS#H3VLOF;JS#H1UP;JS#H2UP;JS#H3UP;WT200

JS#MV_SBY;AP_TE=0;AP_TP=TIME;VLV=VSTORE

PING=0;AP_OUT=1;EN

REM !!!! Trackball (Thread 2) !!!!

#TB_XY,ST,AM

DC 125000,125000,960000/SCALE_Z

AC 125000,125000,425000/SCALE_Z;JS#LED_XY

SX=FSTX;SY=FSTY;SZ=0;DE*=0;MX=0;MY=0;MZ=0;MXL=0

MYL=0;MZL=0;MT=TIME;DE MXL,MYL,MZL;MTL=MT;SH;JG 0,0,0;BGXYZ

#TB_XY1;DT=MT-MTL;MTL=MT;MT=TIME;MXL=MX;MYL=MY;MZL=MZ

MZ=DEX;MX=DEX;MY=DEY;MDT=MT-MTL;VELX=SX*(MX-MXL)/MDT

VELY=SY*(MY-MYL)/MDT;VELZ=SZ*(MZL-MZ)/MDT;JP#MCHKZP,CAXIS=4

#MCHKXP;JP#MCHKXN,VELX<0,JP#MCHKYP,TPX+1000<FLX;VELX=0;JP#MCHKYP

#MCHKXN;JP#MCHKYP,TPX-1000>BLX;VELX=0

#MCHKYP;JP#MCHKYN,VELY<0,JP#TB_XY2,TPY+1000<FLY;VELY=0;JP#TB_XY2

#MCHKYN;JP#TB_XY2,TPY-1000>BLY;VELY=0;JP#TB_XY2

#MCHKZP;JP#MCHKZN,VELZ<0,JP#TB_XY2,TPZ+1000<FLZ;VELZ=0;JP#TB_XY2

#MCHKZN;JP#TB_XY2,TPZ-1000>BLZ;VELZ=0

#TB_XY2;JG VELX,VELY,VELZ;JP#TB_XY1

REM !!!! Teach Pendant Routines (Thread 1) !!!!

#RM_TCH;JS#RM_AX,@IN[iAXIS]=0;JS#PR_MN,@IN[iPURGE]=0

TETIME=TIME;JS#TE_F2,@IN[iTEACH]=0;EN

#RM_AX;CAXIS=CAXIS+1;JS#RM_AR,CAXIS>4;JS#AX_XY,CAXIS=1

JS#AX_X,CAXIS=2;JS#AX_Y,CAXIS=3;JS#AX_Z,CAXIS=4;EN

#RM_AR;CAXIS=1;EN

#LED_XY;SB3;SB4;CB1;CB2;EN

#LED_X;SB2;SB3;SB4;CB1;EN

#LED_Y;SB1;SB3;SB4;CB2;EN

#LED_Z;SB1;SB2;SB4;CB3;EN

#LED_W;SB1;SB2;SB3;CB4;EN

#LED_RS;SB1;SB2;SB3;SB4;SB6;EN

REM !!!! LCD Screens !!!!

#INITLCD;CC 9600,0,0,0;WT500;JS#CLS;EN

#CLS;MG{P2}{N}{^17},{^12},{^01},{^02},{^18};EN

#L1;MG{P2}{N}{^17},{^25},{^128},{^18};EN

#L2;MG{P2}{N}{^17},{^25},{^192},{^18};EN

#S001;JS#CLS

JS#L1;MG{P2}{N}"Precision Valve & Automation";MG{P2}{N}" Inc"

JS#L2;MG{P2}{N}"System Initialization, please ";MG{P2}{N}"wait... ";EN

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```
#S002;JS#CLS;JS#L1;MG{P2}{N}"Press F1 to home the system. ";EN

#S003;JS#CLS
JS#L1;MG{P2}{N}"Cycle Stop ";MG{P2}{N}" "
JS#L2;MG{P2}{N}"PROG F&F CAL MAN AUTO STAT";MG{P2}{N}" SETUP";EN

#S004;JS#CLS
JS#L1;MG{P2}{N}"Select Program: ",A_PROGA[CPROG]{S},A_PROGB[CPROG]{S}
JS#L2;MG{P2}{N}"EXIT PREV NEXT";EN

#S005
MG{P2}{N}{^17},{^25},{^144},{^18},A_PROGA[CPROG]{S},A_PROGB[CPROG]{S};EN

#S006;JS#CLS
JS#L1;MG{P2}{N}" SOLV MAT ";MG{P2}{N}"FLSH& "
JS#L2;MG{P2}{N}"EXIT FLSH FILL ";MG{P2}{N}"FILL ";EN

#S007;JS#CLS
JS#L1;MG{P2}{N}"Solvent Flush in Progress... ";MG{P2}{N}" "
JP#NOOP,(ACFLAG=1)
JS#L2;MG{P2}{N}"EXIT ";MG{P2}{N}" ";EN

#S008;JS#CLS
JS#L1;MG{P2}{N}"Material Fill in Progress... ";MG{P2}{N}" "
JP#NOOP,(ACFLAG=1)
JS#L2;MG{P2}{N}"EXIT ";MG{P2}{N}" ";EN

#S009;JS#CLS;JS#L1;MG{P2}{N}"Calibration"
JS#L2;MG{P2}{N}"EXIT HOME ";MG{P2}{N}" ";EN

#S010;JS#CLS;JS#L1;MG{P2}{N}"Jog Mode Head: ",A_HEAD[CHEAD]{S}
MG{P2}{N}A2HEAD[CHEAD]{S}," Axis: ",AXIS[CAXIS]{S}
JS#L2;MG{P2}{N}"EXIT TEACH VLV RUN PURG TP ";MG{P2}{N}" AXIS";EN

#S011;MG {P2}{N}{^17},{^25},{^157},{^18},AXIS[CAXIS]{S};EN

#S011B;MG {P2}{N}{^17},{^25},{^164},{^18},AXIS[CAXIS]{S};EN

#S012;MG {P2}{N}{^17},{^25},{^153},{^18},A_HEAD[CHEAD]{S},A2HEAD[CHEAD]{S};EN

#S013;JS#CLS
JS#L1;MG{P2}{N}"Warning! Solvent not been";MG{P2}{N}" flushed! "
JS#L2;MG{P2}{N}"EXIT CONT ";MG{P2}{N}" ";EN

#S015;JS#CLS
JS#L1;MG{P2}{N}"Trackball Control Current: ",AXIS[CAXIS]{S}
JS#L2;MG{P2}{N}"EXIT TEACH PURG X&Y X Y ";MG{P2}{N}" Z ";EN

#S016;JS#CLS;JS#L1;MG{P2}{N}"Valve Functions Head: "
MG{P2}{N} A_HEAD[CHEAD]{S},A2HEAD[CHEAD]{S}
JS#L2;MG{P2}{N}"EXIT PURG SEL UP DOWN ";MG{P2}{N}" "

#S017;JP#OPT3,R_HEAD[CHEAD]=1
```

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Software Code: PROPRIETARY/IRRELEVANT

MG{P2}{N}{^17},{^25},{^218},{^18}," ";EN

#OPT3;MG{P2}{N}{^17},{^25},{^218},{^18},"ROTA ROTB";EN

#S019;JS#CLS;JS#L1;MG{P2}{N}"Homing axes. Please wait..." ;EN

#S020;JS#CLS;JP#OPT1,VLV=0
JS#L1;MG{P2}{N}"Auto Cycle WET Count:",{F8.0}CCNT;JP#OPT2

#OPT1;JS#L1;MG{P2}{N}"Auto Cycle DRY Count:",{F8.0}CCNT

#OPT2;JS#L2;MG{P2}{N}"STOP "
MG{P2}{N} A_PROGA[CPROG]{S},A_PROGB[CPROG]{S};JP#NOOP,AC_TMR=0
JP#NOOP,CTM=0;MG{P2}{N}" ",{F3.1}CTM*0.9766/1000," Sec.";EN

#S021;JS#CLS
JS#L1;MG{P2}{N}"In Cycle... Count:",{F8.0}CCNT;JP#OPT2

#S022;JS#CLS
JS#L1;MG{P2}{N}"Press F2 or F3 to run",MG{P2}{N}" 1 cycle. "
JS#L2;MG{P2}{N}"EXIT WET DRY ",A_PROGA[CPROG]{S},A_PROGB[CPROG]{S}
JP#NOOP,AC_TMR=0,JP#NOOP,CTM=0;MG{P2}{N}" ",{F3.1}CTM*0.9766/1000," Sec.";EN

#S024;JS#CLS;JS#L1;MG{P2}{N}"Status"
JS#L2;MG{P2}{N}"EXIT STAT ";MG{P2}{N}" ";EN

#S025;LCD2=LCD1+2;LCD4=LCD3+2
MG{P2}{N}{^17},{^25},{^213},{^18},ASTRSK[LCD1]{S}
MG{P2}{N}{^17},{^25},{^218},{^18},ASTRSK[LCD2]{S}
MG{P2}{N}{^17},{^25},{^223},{^18},ASTRSK[LCD3]{S}
MG{P2}{N}{^17},{^25},{^228},{^18},ASTRSK[LCD4]{S};EN

#S030;JS#CLS
JS#L1;MG{P2}{N}"Setup Counter F&F Auto Purg";MG{P2}{N}"e Run Mode"
JS#L2;MG{P2}{N}"EXIT CNT RES OPT ON OFF";MG{P2}{N}" WET DRY";EN

#S031;JS#CLS;JS#L1;MG{P2}{N}"Count:",{F8.0}CCNT;EN

#S039;JS#CLS;JS#L1;MG{P2}{N}"Moving to Solvent!!!";EN

#S040;JS#CLS;JS#L1;MG{P2}{N}"AUTO PURGE!!!";EN

#S041;JS#CLS;JS#L1;MG{P2}{N}"Current Position: "
JS#L2;MG{P2}{N}"X",_TPX{F6.0},"Y",_TPY,"Z",_TPZ;EN

#S045;JS#CLS;JS#L1;MG{P2}{N}"Start switches activated!"
JS#L2;MG{P2}{N}"Deactivate to continue the pro";MG{P2}{N}"gram. ";EN

#S076;JS#CLS;JS#L1;MG{P2}{N}"Waiting for path...";EN

#S100;JS#CLS
JS#L1;MG{P2}{N}"Saving data...please wait.";WT150;BV;JS#FKEYREL;EN

#S159;JS#CLS

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EXHIBIT 34
Software Code: Proprietary/irrelevant

JS#L1;MG{P2}{N}"Checking for exhaust input. Ple";MG{P2}{N}"ase wait.";EN

#S160;JS#CLS

JS#L1;MG{P2}{N}"Verifying exhaust. Please wait.";MG{P2}{N}";EN

#S161;JS#L2;MG{P2}{N}"",{F3.0}(FAN_WT/1000);EN

#S198;JS#CLS;JS#L1;MG{P2}{N}ECOD1[MEC]{S},ECOD2[MEC]{S}
MG{P2}{N}ECOD3[MEC]{S},ECOD4[MEC]{S},ECOD5[MEC]{S}
JS#L2;MG{P2}{N}"Press F1 to continue the progr";MG{P2}{N}"am.";MERR=MEC
JS#WAIT_F1;JS#FAN_WT;JP#ESTOP1

#S199;JP#ESTOP1,MERR=MEC;JS#CLS
JS#L1;MG{P2}{N}OPF1[PNEC]{S},OPF2[PNEC]{S},OPF3[PNEC]{S},OPF4[PNEC]{S}
MG{P2}{N}" failure.";JS#L2;MG{P2}{N}"Repair and press F1."
MERR=MEC;JS#WAIT_F1;JS#FKEYREL,VPNT0=0;PNEC=0;JP#ESTOP1

#S200;JP#ESTOP1,MERR=MEC;JS#CLS;JS#L1;MG{P2}{N}ECOD1[MEC]{S},ECOD2[MEC]{S}
MG{P2}{N}ECOD3[MEC]{S},ECOD4[MEC]{S},ECOD5[MEC]{S}
JS#L2;MG{P2}{N}"to continue the program.";MERR=MEC;JP#ESTOP1

#S201;JS#CLS;JS#L1;MG{P2}{N}"Error",{F3.0}ERR," on line",{F4.0}LINE,""
JS#L2;MG{P2}{N}"Press F1 to restart, F5 for st";MG{P2}{N}"atus. ";EN

#S202;JS#CLS
JS#L1;MG{P2}{N}"Position Error. F1-restart, F5-";MG{P2}{N}"status. "
JS#L2;MG{P2}{N}"Stop codes (x,y,z",{F3.0}_SCX,"",{F3.0}_SCY,""
MG{P2}{N}{F3.0}_SCZ;EN

#S203;JS#CLS
JS#L1;MG{P2}{N}"Limit Error. F1-restart, F5-sta";MG{P2}{N}"tus. "
JS#L2;MG{P2}{N}"Stop codes (x,y,z",{F3.0}_SCX,"",{F3.0}_SCY,""
MG{P2}{N}{F3.0}_SCZ;EN

#S204;JS#CLS;JS#L1;MG{P2}{N}"Variable error."
JS#L2;MG{P2}{N}"Initializing...";EN

#S205;JS#CLS
JS#L1;MG{P2}{N}"Unrecoverable variable error d";MG{P2}{N}"uring "
JS#L2;MG{P2}{N}"startup. Restart the machine.";HX

#S206;JS#CLS
JS#L1;MG{P2}{N}"Subroutine error. The subrout";MG{P2}{N}"ine is not"
JS#L2;MG{P2}{N}"stored in segment 1, 2 or 3.";EN

#S208;JP#ESTOP1,MERR=MEC;MERR=MEC;JS#CLS
JS#L1;MG{P2}{N}"Press F1 to return head to sta";MG{P2}{N}"ndby."
JS#L2;MG{P2}{N}" OK";JP#ESTOP1

#S209;JS#CLS;JS#L1;MG{P2}{N}"Press F1 to restart.";JS#L2;MG{P2}{N}" OK";EN

#S210;JP#ESTOP1,MERR=MEC;JS#CLS;JS#L1;MG{P2}{N}ECOD1[MEC]{S},ECOD2[MEC]{S}
MG{P2}{N}ECOD3[MEC]{S},ECOD4[MEC]{S},ECOD5[MEC]{S};MERR=MEC
JS#L2;MG{P2}{N}"Press F1 to continue.";JS#WAIT_F1;LL_ERR=0;JP#ESTOP1

```
REM !!!! Error-Checking Subroutines !!!!
#WAIT_F1;JP#WAIT_F1,@IN[80]=1;JS#FKEYREL;EN

#FKEYREL;VRESUME=@IN[73]&@IN[74]&@IN[75]&@IN[76]
VRESUME=VRESUME&@IN[77]&@IN[78]&@IN[79]&@IN[80]
JP#FKEYREL,VRESUME=0;WT50;EN

#TKEYREL;VRESUME=@IN[iTEACH]&@IN[iPURGE]&@IN[iAXIS]
JP#TKEYREL,VRESUME=0;WT50;EN

#S_ONE;JP#S_ONE,@IN[CKSEN]=0;EN

#S_ZERO;JP#S_ZERO,@IN[CKSEN]=1;EN

#OPTO;TSTART=TIME

#OPTO2;JP#NOOP,@IN[SENINP]=ZORO,JP#OPTO2,(TIME-TSTART)<PNT0;VPNT0=1;WT999;EN

#DR_CLOS;JP#DR_SHUT,@IN[iDOOR]=1,JS#CLS;JS#L1
MG{P2}{N}"Close door to continue."

#DR_CLO1;JP#DR_CLO1,@IN[iDOOR]<>1

#DR_SHUT;DRFLAG=1;JP#NOOP,TEACH=0;JS#CLS;JS#L1,MG{P2}{N}"Cycle in progress.";EN

#SAFEZ;PAZ=0;BGZ;AMZ;JS#ALLUP,SO_EN=1;EN

REM !!!! Group Subroutines !!!!
#ALLUP;JS#H1UP;JS#H2UP;JS#H3UP;JS#H1RA;JS#H2RA;JS#H3RA;EN

REM !!!! Variable Assignments !!!!
#GETASN;NA=0

REM -----
REM !! Inputs !!
REM -----

iESTOP=1;iSTART=2;iDOOR=3;iBYPASS=4;iPOWER=5
iLEVELA=49;iLEVELB=67
iAXIS=22;iPURGE=23;iTEACH=24
FKEY1=80;FKEY2=79;FKEY3=78;FKEY4=77;FKEY5=76;FKEY6=75;FKEY7=74;FKEY8=73
iFLOW=64

iH1Z=53

iH2Z=54
iH2RB=55
iH2RA=56

REM -----
REM !! Outputs !!
REM -----
```

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Software Code: Proprietary/irrelevant

oH1Z=25
oH1V=27
oH1AT=26

oH2Z=28
oH2V=31
oH2RB=29
oH2RA=30

oSOLV=32
oMATV=33

OPF1[1]="";OPF2[1]="";OPF3[1]="";OPF4[1]=""
OPF1[2]="";OPF2[2]="";OPF3[2]="";OPF4[2]=""
OPF1[3]="";OPF2[3]="";OPF3[3]="";OPF4[3]=""
OPF1[4]="";OPF2[4]="";OPF3[4]="";OPF4[4]=""
OPF1[5]="Spray";OPF2[5]=" Z-";OPF3[5]="slide ";OPF4[5]="UP"
OPF1[6]="Spray";OPF2[6]=" Z-";OPF3[6]="slide ";OPF4[6]="DOWN"
OPF1[7]="Dispen";OPF2[7]="se Z-";OPF3[7]="slide ";OPF4[7]="UP"
OPF1[8]="Dispen";OPF2[8]="se Z-";OPF3[8]="slide ";OPF4[8]="DOWN"
OPF1[9]="HD3";OPF2[9]=" Z-";OPF3[9]="slide ";OPF4[9]="UP"
OPF1[10]="HD3";OPF2[10]=" Z-";OPF3[10]="slide ";OPF4[10]="DOWN"
OPF1[11]="Spray";OPF2[11]=" r";OPF3[11]="otary";OPF4[11]="0 deg"
OPF1[12]="Spray";OPF2[12]=" r";OPF3[12]="otary ";OPF4[12]="45 deg"
OPF1[13]="Dispen";OPF2[13]="se r";OPF3[13]="otary ";OPF4[13]="0 deg"
OPF1[14]="Dispen";OPF2[14]="se r";OPF3[14]="otary ";OPF4[14]="45 deg"
OPF1[15]="HD3";OPF2[15]=" r";OPF3[15]="otary ";OPF4[15]="0 deg"
OPF1[16]="HD3";OPF2[16]=" r";OPF3[16]="otary ";OPF4[16]="45 deg"

ECOD1[1]="Emerge";ECOD2[1]="ncy St";ECOD3[1]="op. Re";ECOD4[1]="set bu"
ECOD5[1]="tton";ECOD1[2]="Left ";ECOD2[2]="Door ";ECOD3[2]="open. "
ECOD4[2]="Close";ECOD5[2]="";ECOD1[3]="";ECOD2[3]="Door "
ECOD3[3]="open. ";ECOD4[3]="Close";ECOD5[3]="";ECOD1[4]="Materi"
ECOD2[4]="al A L";ECOD3[4]="evel l";ECOD4[4]="ow. ";ECOD5[4]=""
ECOD1[5]="Materi";ECOD2[5]="al B L";ECOD3[5]="evel l"
ECOD4[5]="ow. ";ECOD5[5]="";ECOD1[6]="Exhaus";ECOD2[6]="t Flow"
ECOD3[6]=" low. ";ECOD4[6]="";ECOD5[6]="";EN

REM !!!! Machine-Specific Information !!!!
#IMACH;MT 1,1,1;CE 0,0,0
FSTX=20000;SLWX=10000
FSTY=20000;SLWY=10000
FSTZ=10000;SLWZ=5000

KNHEAD=2
A_HEAD[1]="Spray ";A2HEAD[1]=" ";R_HEAD[1]=0
A_HEAD[2]="Dispen";A2HEAD[2]="se ";R_HEAD[2]=1
A_HEAD[3]="HD3";A2HEAD[3]=" ";R_HEAD[3]=1

REM !!! Added Y offset to Home Routine !!!
XOFF=0
YOFF=703
ZOFF=0

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Software Code. EXHIBIT 94 Proprietary/irrelevant

PT_APG[0]=70700;PT_APG[1]=53663;PT_APG[2]=2478
PT_CAL[0]=6660;PT_CAL[1]=41194;PT_CAL[2]=13921
PT_SBY[0]=33500;PT_SBY[1]=36600;PT_SBY[2]=250
PT_SOL[0]=70850;PT_SOL[1]=27679;PT_SOL[2]=9000

AP_EN=0;AP_LEN=2000;AP_TIME=30000;SLP_TM=30000;SO_EN=1
PNT0=4000;AC_TMR=1;LLA_EN=0;LLB_EN=0;XFL_EN=0

MIN_FLSH=0
MIN_FILL=0
MAX_FLSH=150000
MAX_FILL=150000
MIN_FNF=0
MAX_FNF=18000000

#TUNE;WT100
AC 150000,150000,150000/SCALE_Z
DC 150000,150000,150000/SCALE_Z
SP 60000,60000,100000/SCALE_Z
VA 70000,70000,70000
VD 70000,70000,70000
BL -4000,-2500,-1500
FL 71000,70500,16600
TL 9.9999,9.9999,9.9999
KD 67.99,82.43,305.75
KP 5.66,6.75,199.94
KI 0.25,0.19,0.34;EN

#SCALE;SCALE_Z=10;MO,SF 1,1,SCALE_Z;EN

REM !!!! Pneumatic and Dispensing Subroutines !!!!

#H1VLON;JP#NOOP,VLV=0;CB oH1AT;WT250;CB oH1V;AP_TP=TIME;EN
#H1VLOF;JS#APRS,@OUT[oH1V]=0;SB oH1V;WT50;SB oH1AT;EN
#H1UP;PNEC=5;SENINP=iH1Z;ZORO=1;SB oH1Z;JS#OPTO;EN
#H1DW;PNEC=6;SENINP=iH1Z;ZORO=0;CB oH1Z;JS#OPTO;EN
#H1RA;EN
#H1RB;EN

#H2VLON;JP#NOOP,VLV=0;CB oH2V;AP_TP=TIME;EN
#H2VLOF;JS#APRS,@OUT[oH2V]=0;SB oH2V;EN
#H2UP;PNEC=7;SENINP=iH2Z;ZORO=1;SB oH2Z;JS#OPTO;EN
#H2DW;PNEC=8;SENINP=iH2Z;ZORO=0;CB oH2Z;JS#OPTO;EN
#H2RA;PNEC=13;SENINP=iH2RA;ZORO=0;SB oH2RB;CB oH2RA;JS#OPTO;EN
#H2RB;PNEC=14;SENINP=iH2RB;ZORO=0;SB oH2RA;CB oH2RB;JS#OPTO;EN

#H3VLON;EN
#H3VLOF;EN
#H3UP;EN
#H3DW;EN
#H3RA;EN
#H3RB;EN

#SOLV

```
CB oSOLV
SB oMATV
SOLVENT=1
BV
EN

#MATV
CB oMATV
SB oSOLV
SOLVENT=0
BV
EN

#NOOP;EN
#APRS;AP_TP=TIME;EN
#EOM
EN
\
```

3267 M06.txt[8/25/2017 9:15:08 AM]

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EXHIBIT 34

Software Code: Proprietary/irrelevant

The following features were added for this rework:

CYCLESTOP:

"F&F" button for Flush & Fill menu. Upon pressing this button, the gantry will move to the purge position.

The menu contains the following options:

- "SOLV FLSH": Clears output bit for Pneum. Ball valve, flushes solvent through both valves for amount of time set in Setup (default of 30 sec)
- "MAT FIL": Sets output bit for Pneum. Ball Valve, runs material through both valves for amount of time set in Setup (default of 30 sec)
- "FLSH&FILL": Runs through Solvent Flush routine followed by Material Fill routine.

SETUP:

"F&F OPT" button for Flush & Fill Options, contains the following:

- "AUTO OPT": Goes to separate menu for Autocycle exclusive options
 - "FLSH s." displays the Solvent Flush time in seconds
 - "Fil s." displays the Material Fill time in seconds
 - each amount of time has an "UP" and "DW" button to adjust with.
- Current limits are set at 0 and 150 sec for each

AUTO OPT:

- "F&F" with "ON" and "OFF" buttons underneath. This determines if the auto Flush & Fill feature will be used in Autocycle or not.
- "Freq min": displays the frequency in minutes that a flush and fill will occur in Autocycle (default of 30 min)
 - Current limits are set at 0 and 300 min

Additional:

- If a manual Solvent Flush is done from Cycle Stop, and the operator enters Manual Mode or AutoCycle without filling material again, they will receive a warning message.

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```

REM Machine Style: 350_W3SD
NO Author: JBB Date: 10/09/2006 Version: 1.00
NO Project: SPCX2115 Serial #: W3267 Company: Space.X
NO Modified by: NS Date: 5/1/09
REM PathMaster version: 2.00+
REM
REM =====
REM Revision History
REM =====
REM Change:                                Date:      By:
REM -----
REM - Added Teach Pendant Routines.         7/3/02      TMB
REM - Added Solvent Cup Routines.           7/3/02      TMB
REM - Added Z Axis Scaling (Requires n17e firmware). 2/06/04      TMB
REM 2- Modified Cal routine, Solvent position 6/23/09      AH
REM 3- Added Y offset to Home Routine.       7/2/09      AJH
REM 5- Added Auto Solvent Flush             10/11/13     FP
REM -----
REM
REM This software, including the information contained
REM herein, is the property of Precision Valve & Automation,
REM Inc. or its licensee and is considered confidential and proprietary
REM information. It is delivered on the express condition that
REM it not be used, disclosed, or reproduced in whole or in
REM part, for any reason without prior written consent of
REM Precision Valve & Automation, Inc.
REM
REM (C) 2006 Precision Valve & Automation, Inc.
REM
REM !!!! Startup And Scan Routines (Thread 0) !!!!
#AUTO;PASSED=0;POS_VAL=0;FANPASS=0
#AUTO1;DOG=40;TRY_RES=0;SDE=0
#AUTO2;AB1;JS#SCALE;JS#PRE_CHK
#SCAN;AP_TE=(TIME-AP_TP)*AP_EN;JP#FESTOP,(@IN[iFLOW]*XFL_EN)=1
JP#ESTOP,@IN[iESTOP]=1
JP#ESTOP,(1-@IN[iDOOR])&DRFLAG=1
JP#ESTOP,(1-@IN[iDOOR])&@IN[iBYPASS]=1
JP#ESTOP,LL_ERR<>0;DOG=67
JP#ESTOP,VPNT0=1
JS#OSTOP,(OUTAC+@IN[FKEY1])=0;FPOWER=1;JP#SCAN
#OSTOP;CSTOP=1;EN
#FESTOP;FAN_ERR=1;JP#ESTOP

REM !!!! Auxiliary Error Routines (Thread 1) !!!!
#KEYMON;JP#KEYMON,MERR*(1-@IN[FKEY1])<>-1;KEY1=1;EN

REM !!!! Emergency Stop and Error Routine (Thread 0) !!!!
#ESTOP;ETIME=TIME;HX1;HX2;HX3
OP $EF,$FFF,$FFF,$FFF,$FFF
WT100;AB1;MO;KEY1=0;MEC=20
JS#SS_ER;ERX=30000;ERY=30000;ERZ=30000;MERR=0;TEACH=0;FPOWER=0;XQ#KEYMON,2
#ESTOP1;WT150;MEC=1;JP#S200,@IN[iESTOP]=1
MEC=3;JP#S200,(1-@IN[iDOOR])&@IN[iBYPASS]=1

```

3267_M07.lx[8/25/2017 9:15:48 AM]

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Software Code: ^{EXHIBIT 34} Proprietary/irrelevant

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```
MEC=3;JP#S200,DRFLAG&(1-@IN[iDOOR])=1
MEC=4;JP#S210,LL_ERR=14;MEC=5;JP#S210,LL_ERR=39
MEC=6;JP#S198,FAN_ERR=1
MEC=7;JP#S199,VPNT0=1;JP#ESTOP2,POS_VAL=0
MEC=-1;JP#S208,KEY1=0;JS#FKEYREL;MERR=0
ERX=1000;ERY=1000;ERZ=1000;JS#DR_CLOS;PING=0;AP_OUT=1
MODE=0
HX1;HX2;ACFLAG=0;VLV=VSTORE;SB5;WT700;CS;SH;WT100;XQ#CS_MN1,1;JP#SCAN
#ESTOP2;MERR=-2;JS#S209;JS#WAIT_F1;HX1;HX2;ZS0;DP 0,0,0;JP#AUTO1
```

```
REM !!!! Command Error Routine (Thread 0) !!!!
#CMDERR;HX1;HX2;HX3;ST;AM;MO
  OP $EF,$FFFF,$FFFF,$FFFF,$FFFF
  SH;TEACH=0;FPOWER=0;ERR=_TC;MEC=11
  LINE= ED;MERR=11;JS#SS_ER;JP#GSERR,SDE=41;JP#RESET,INIT*ERR=9
  JP#RESET,INIT*ERR=83;JS#S201;JS#FKEYREL;JS#ER_WT;HX1;JP#AUTO1
#GSERR;JS#S206,HX
```

```
REM !!!! Position Error Routine (Thread 0) !!!!
#POSERR;HX1;HX2;HX3;JS#S202;ST;AM;MO
  OP $EF,$FFFF,$FFFF,$FFFF,$FFFF
  TEACH=0;POS_VAL=0;FPOWER=0
  MEC=12;MERR=12;JS#SS_ER;JS#FKEYREL;JS#ER_WT
  HX1;ZS0;DP 0,0,0;JP#AUTO1
```

```
REM !!!! Limit Error Routine (Thread 0) !!!!
#LIMSWI;TEACH=0;JP#LS_HOME,HOMING=1;POS_VAL=0;HX1;HX2;HX3;JS#S203;ST;AM;MO
  MEC=13;MERR=13;JS#SS_ER;FPOWER=0
  OP $EF,$FFFF,$FFFF,$FFFF,$FFFF
  JS#FKEYREL
  JS#ER_WT;HX1;ZS0;DP 0,0,0;JP#AUTO1
#LS_HOME;RE
```

```
REM !!!! Startup Delay for Fan !!!!
#FAN_WT;HX1;FAN_WT=60000
  FAN_INC=1000;JS#S159;WT2000;JP#FAN_ER,@IN[iFLOW]=1;JS#S160
#FAN_WT1;WT FAN_INC;JS#S161;FAN_WT=(FAN_WT-FAN_INC)
  JP#FAN_ER,@IN[iFLOW]=1;JP#FAN_WT1;FAN_WT>0;FAN_ERR=0;FANPASS=1;EN
#FAN_ER;ZS1;FAN_ERR=1;FANPASS=0;JP#ESTOP
```

```
REM !!!! Machine Error Subroutines (Thread 0) !!!!
#ER_WT;JP#NOOP,@IN[FKEY1]=0;JP#ER_ST,@IN[FKEY5]=0;JP#ER_WT
#ER_ST;JS#FKEYREL;JS#SS_MN;JS#ER_SC;JP#ER_WT
#ER_SC;JS#FKEYREL;JS#S201,MERR=11;JS#S202,MERR=12;JS#S203,MERR=13;EN
```

```
REM !!!! Pre-Start Routines !!!!
#PRE_CHK;JS#INIT;JS#FAN_WT,((1-FANPASS)*XFL_EN)=1;JS#SF_MN,PASSED=0;SB5
  JP#PRE_HM,POS_VAL=0;ACM_ER=(@ABS[_TEX]+@ABS[_TEY]+@ABS[_TEZ])
  JP#PRE_HM,ACM_ER>800;XQ#CS_MN1,1;EN
#PRE_HM;POS_VAL=0;XQ#CS_MN,1;EN
```

```
REM !!!! Start-up Safety Check (Thread 0) !!!!
#SF_MN;MO;CHECK=0;VFAIL=0
  JS#CLS;JS#L1;MG{P2}{N}"Machine Safety Check"
```

```

VESPP=1;VDSPP=1;JS#L2;MG{P2}{N}"Press F1 to initiate."
JS#WAIT_F1
#SF_LP;JP#SF_FE,VFAIL=1;JP#SF_FD,VFAIL=2;JP#SF_FP,VFAIL=5
JP#SF_NE,@IN[iESTOP]=1;JP#SF_ND,@IN[iDOOR]=0;JP#SF_NK,@IN[iBYPASS]=0
JP#SF_CP,CHECK=0;JP#SF_CE,CHECK=1;JP#SF_CD,CHECK=2;PASSED=1;EN

#SF_NE;JS#CLS;JS#L1;MG{P2}{N}"Undo the EStop button.";CKSEN=iESTOP
JS#S_ZERO;JP#SF_LP
#SF_ND;JS#CLS;JS#L1;MG{P2}{N}"Close the door.";CKSEN=iDOOR
JS#S_ONE;JP#SF_LP
#SF_NK;JS#CLS;JS#L1;MG{P2}{N}"Turn the Door Bypass key to OFF";CKSEN=iBYPASS
JS#S_ONE;JP#SF_LP
#SF_CP;CB5;VCHECK=iPOWER;VSTATE=0;VFAIL=5;JS#SF_DD;JP#SF_LP,VFAIL<>0;SB5
VFAIL=5;VSTATE=1;JS#SF_DD;CHECK=1;JP#SF_LP
#SF_CE;VCHECK=iESTOP;JS#CLS;JS#L1;MG{P2}{N}"Press the EStop button.";VESPP=1
VSTATE=1;VFAIL=1;JS#SF_DD;JP#SF_LP,VFAIL<>0;VCHECK=iPOWER;VSTATE=0;VFAIL=5
VESPP=0;JS#SF_DD;VESPP=1;CHECK=2;JP#SF_LP
#SF_CD;VCHECK=iDOOR;JS#CLS;JS#L1;MG{P2}{N}"Open the door.";VDSPP=1
VSTATE=0;VFAIL=2;JS#SF_DD;JP#SF_LP,VFAIL<>0;VCHECK=iPOWER;VSTATE=0;VFAIL=5
VDSPP=0;JS#SF_DD;VDSPP=1;CHECK=3;JP#SF_LP
#SF_DD;SFTMR=TIME;WT500
#SF_DD1;JP#SF_DD2,(VFAIL-1)*(@IN[iESTOP])*VESPP<>0
JP#SF_DD2,(VFAIL-2)*(1-@IN[iDOOR])*VDSPP<>0
JP#SF_DD2,@IN[iBYPASS]=0
JP#NOOP,(TIME-SFTMR)>8000;JP#SF_DD1,@IN[VCHECK]<>VSTATE;VFAIL=0;EN
#SF_DD2;ZS1;VFAIL=0;JP#SF_LP
#SF_FP;CB5;JS#CLS;JS#L1;MG{P2}{N}"Power check failed.";JP#SF_FAIL
#SF_FE;JS#CLS;JS#L1;MG{P2}{N}"EStop button failed.";JP#SF_FAIL
#SF_FD;JS#CLS;JS#L1;MG{P2}{N}"Door safety failed.";JP#SF_FAIL
#SF_FAIL;JP#SF_OVER,SAFE<>0;JS#L2;MG{P2}{N}"Press F1 to repeat test."
JS#WAIT_F1;SAFE=1;JP#SF_MN
#SF_OVER;JS#L2;MG{P2}{N}"Repair and restart machine.";ZS0;HX

REM !!!! Program Status Report (Thread 0 or 1) !!!!
#SS_MN;JS#CLS
JS#L1;MG{P2}{N}"Machine Status Report. Press ";MG{P2}{N}"F1 to "
JS#L2;MG{P2}{N}"scroll through screens or F8 t";MG{P2}{N}"o quit. "
JS#SS_LP

JS#CLS;JS#L1;MG{P2}{N}"X-axis Enc.Pos. Com.Pos. P"
MG{P2}{N}"os.Err. "
JS#L2;MG{P2}{N}" ",{F6.0}_TPX," ",{F6.0}_RPX," ",{F6.0}_TEX
JS#SS_LP

JS#CLS
JS#L1;MG{P2}{N}"Y-axis Enc.Pos. Com.Pos. P";MG{P2}{N}"os.Err. "
JS#L2;MG{P2}{N}" ",{F6.0}_TPY," ",{F6.0}_RPY," ",{F6.0}_TEY
JS#SS_LP

JS#CLS
JS#L1;MG{P2}{N}"Z-axis Enc.Pos. Com.Pos. P";MG{P2}{N}"os.Err. "
JS#L2;MG{P2}{N}" ",{F6.0}_TPZ," ",{F6.0}_RPZ," ",{F6.0}_TEZ
JS#SS_LP

```

JS#CLS;N1=_MOX;JS#L1;MG{P2}{N}"X-axis Motors On/Off Torque"
MG{P2}{N}" Tor.Lim.";JS#L2;MG{P2}{N}" ",HLW[N1]{S3}
MG{P2}{N}" ",{F1.4}_TTX," ",{F1.4}_TLX
JS#SS_LP

JS#CLS;N1=_MOY;JS#L1;MG{P2}{N}"Y-axis Motors On/Off Torque"
MG{P2}{N}" Tor.Lim.";JS#L2;MG{P2}{N}" ",HLW[N1]{S3}
MG{P2}{N}" ",{F1.4}_TTY," ",{F1.4}_TLY
JS#SS_LP

JS#CLS;N1=_MOZ;JS#L1;MG{P2}{N}"Z-axis Motors On/Off Torque"
MG{P2}{N}" Tor.Lim.";JS#L2;MG{P2}{N}" ",HLW[N1]{S3}
MG{P2}{N}" ",{F1.4}_TTZ," ",{F1.4}_TLZ
JS#SS_LP

JS#CLS;N1=_HMX;N2=_LFX;N3=_LRX
JS#L1;MG{P2}{N}"X-axis Sensors Home For.Lim.";MG{P2}{N}" Rev.Lim."
JS#L2;MG{P2}{N}" ",HLW[N1]{S3}," ",HLW[N2]{S3}
MG{P2}{N}" ",HLW[N3]{S3}
JS#SS_LP

JS#CLS;N1=_HMY;N2=_LFY;N3=_LRY
JS#L1;MG{P2}{N}"Y-axis Sensors Home For.Lim.";MG{P2}{N}" Rev.Lim."
JS#L2;MG{P2}{N}" ",HLW[N1]{S3}," ",HLW[N2]{S3}
MG{P2}{N}" ",HLW[N3]{S3}
JS#SS_LP

JS#CLS;N1=_HMZ;N2=_LFZ;N3=_LRZ
JS#L1;MG{P2}{N}"Z-axis Sensors Home For.Lim.";MG{P2}{N}" Rev.Lim."
JS#L2;MG{P2}{N}" ",HLW[N1]{S3}," ",HLW[N2]{S3}
MG{P2}{N}" ",HLW[N3]{S3}
JS#SS_LP

JS#CLS
JS#L1;MG{P2}{N}"X-axis Tuning KD KP ";MG{P2}{N}" KI "
JS#L2;MG{P2}{N}" ",{F3.2}_KDX," ",{F3.2}_KPX," ",{F3.2}_KIX
JS#SS_LP

JS#CLS
JS#L1;MG{P2}{N}"Y-axis Tuning KD KP ";MG{P2}{N}" KI "
JS#L2;MG{P2}{N}" ",{F3.2}_KDY," ",{F3.2}_KPY," ",{F3.2}_KIY
JS#SS_LP

JS#CLS
JS#L1;MG{P2}{N}"Z-axis Tuning KD KP ";MG{P2}{N}" KI "
JS#L2;MG{P2}{N}" ",{F3.2}_KDZ," ",{F3.2}_KPZ," ",{F3.2}_KIZ
JS#SS_LP;EN

#SS_LP;JP#WAIT_F1,@IN[FKEY1]=0;JP#SS_LP1,@IN[FKEY8]=0;JP#SS_LP
#SS_LP1;ZS1;JS#FKEYREL;EN
#SS_ER;JP#NOOP,REPORT=0;MG;MG"Error Cause: "{N};MG HLW[MEC]{S}
MG"E-Stop:"{N};MG@IN[iESTOP]{F1.0}
MG"Door:"{N};MG@IN[iDOOR]{F1.0}

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EXHIBIT 34

Software Code: Proprietary/irrelevant

568VA-1263

```
MG"Door Bypass:"{N};MG@IN[iBYPASS]{F1.0}
MG"Exhaust Flow:"{N};MG@IN[iFLOW]{F1.0}
MG"Material A Level:"{N};MG@IN[iLEVELA]{F1.0}
MG"Material B Level:"{N};MG@IN[iLEVELB]{F1.0}
MG"Stop Codes (x,y,z)",MG_SCX{F3.0}{N};MG_SCY{F3.0}{N}
MG_SCZ{F3.0}{N}
MG"Current Error: "{N};TC1;MG"Error on line:",{F3.0}LINE
MG"Current Position (x,y,z)",TPXYZ{F6.0}
MG"Position Error (x,y,z)",TEXYZ{F6.0};EN
```

REM !!!! Initialization Routine (Thread 0) !!!!

```
#INIT;HX1;HX2;HX3;INIT=0;PMX=2;CO 14
OP $EF,$FFFF,$FFFF,$FFFF,$FFFF
CS;JS#INITLCD;JS#S001;WT2000;DA*[0];JS#FKEYREL
DM PT_SBY[4],PT_CAL[4],PT_APG[4],A_HEAD[5],AXIS[6],ASTRSK[4],HLW[30]
DM R_HEAD[5],OPF1[20],OPF2[20],OPF3[20],OPF4[20],ECOD1[10],ECOD2[10]
DM ECOD3[10],ECOD4[10],ECOD5[10],A2HEAD[5],PT_SOL[5]
ASTRSK[0]=" ";ASTRSK[1]="*";ASTRSK[2]="*";FPOWER=0;KEY1=0
ASTRSK[3]=" ";HLW[0]="ON ";HLW[1]="OFF";HLW[2]="OFF";HLW[3]="ON "
HLW[11]="ComErr";HLW[12]="PosErr";HLW[13]="LimErr";HLW[20]="I/O "
AXIS[1]="X&Y";AXIS[2]="X ";AXIS[3]="Y ";AXIS[4]="Z ";ERR=0;LINE=0;REPORT=0
AXIS[5]="W ";OUTAC=1;VLV=1;HOMING=1;VPNT0=0;SAFE=0;TEACH=0;MODE=0;ST_BY=0
AP_TE=0;AP_TP=TIME;ACFLAG=0;VSTORE=1;CAXIS=1;CHEAD=1;PLYBCK=0;FAN_ERR=0
PNEC=0;PING=0;ACINPT=0;VCLEAR=0;AP_OUT=1;FLSO_TM=TIME
DRFLAG=1;MERR=0;JS#GETASN;JS#IMACH;SDE=41;GS#IPROG,#EOM;SDE=0;JS#IPROG
LL_ERR=0;INIT=1;JP#INIT2,CPROG<=KNPROG;CPROG=1
#INIT2;JS#LPPROG;JS#CHECK;INIT=0;EN
```

REM !!!! Check Variables And Reset Routines (Thread 0) !!!!

```
#CHECK;JP#RESET,CPROG<1,JP#RESET,CPROG>KNPROG;JP#RESET,CCNT<0
JP#RESET,FANPASS<0;JP#RESET,POS_VAL<0
JP#RESET,FNF_EN<0
JP#RESET,FNF_TM<0
JP#RESET,FLUSH_TM<0
JP#RESET,FILL_TM<0
JP#RESET,SOLVENT<0
```

EN

```
#RESET;JS#S204;WT2000;JP#S205,TRY_RES=1;HX1;HX2;HX3
DA*,*[0];CCNT=0;CPROG=1;FANPASS=0;POS_VAL=0
FNF_EN=0
FNF_TM=1800000
FLUSH_TM=30000
FILL_TM=30000
SOLVENT=0
TRY_RES=1;PASSED=0;JS#S100;ZS0;JP#AUTO2
```

REM !!!! Load Program Routine (Thread 0) !!!!

```
#LPPROG;SDE=41;JP#LP2,CPROG>1;GS#PROG1,#PROG;JP#LX
#LP2;JP#LP4,CPROG>3;GS#PROG2,#PROG;JP#LX,CPROG=2;GS#PROG3,#PROG;JP#LX
#LP4;JP#LP6,CPROG>5;GS#PROG4,#PROG;JP#LX,CPROG=4;GS#PROG5,#PROG;JP#LX
#LP6;JP#LP8,CPROG>7;GS#PROG6,#PROG;JP#LX,CPROG=6;GS#PROG7,#PROG;JP#LX
#LP8;JP#LP10,CPROG>9;GS#PROG8,#PROG;JP#LX,CPROG=8;GS#PROG9,#PROG;JP#LX
#LP10;JP#LP12,CPROG>11;GS#PROG10,#PROG;JP#LX,CPROG=10;GS#PROG11,#PROG;JP#LX
#LP12;JP#LP14,CPROG>13;GS#PROG12,#PROG;JP#LX,CPROG=12;GS#PROG13,#PROG;JP#LX
```

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EXHIBIT 34

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```
#LP14;JP#LP16,CPROG>15;GS#PROG14,#PROG;JP#LX,CPROG=14;GS#PROG15,#PROG;JP#LX
#LP16;JP#LP18,CPROG>17;GS#PROG16,#PROG;JP#LX,CPROG=16;GS#PROG17,#PROG;JP#LX
#LP18;JP#LP20,CPROG>19;GS#PROG18,#PROG;JP#LX,CPROG=18;GS#PROG19,#PROG;JP#LX
#LP20;JP#LP22,CPROG>21;GS#PROG20,#PROG;JP#LX,CPROG=20;GS#PROG21,#PROG;JP#LX
#LP22;JP#LP24,CPROG>23;GS#PROG22,#PROG;JP#LX,CPROG=22;GS#PROG23,#PROG;JP#LX
#LP24;JP#LP26,CPROG>25;GS#PROG24,#PROG;JP#LX,CPROG=24;GS#PROG25,#PROG;JP#LX
#LP26;JP#LP28,CPROG>27;GS#PROG26,#PROG;JP#LX,CPROG=26;GS#PROG27,#PROG;JP#LX
#LP28;JP#LP30,CPROG>29;GS#PROG28,#PROG;JP#LX,CPROG=28;GS#PROG29,#PROG;JP#LX
#LP30;JP#LP32,CPROG>31;GS#PROG30,#PROG;JP#LX,CPROG=30;GS#PROG31,#PROG;JP#LX
#LP32;GS#PROG32,#PROG;JP#LX
#LX;SDE=0;EN
```

REM !!!! Home Routine (Thread 1) !!!!

```
#MV_HOME;JS#DR_CLOS;JS#S019;POS_VAL=0;HOMING=1
JS#TUNE;ST,AM
FL 200000,200000,200000
BL -200000,-200000,-200000
AC 150000,150000,150000/SCALE_Z
DC 150000,150000,150000/SCALE_Z
OE 1,1,1;JS#ALLUP;ERX=1000;ERY=1000;ERZ=1000;SH
FEZ;SPZ=30000/SCALE_Z;BGZ;AMZ;PR,,1500;BGZ;AMZ
FEZ;SPZ=2000/SCALE_Z;BGZ;AMZ;PR,,1000;SPZ=20000/SCALE_Z;BGZ;AMZ;DPZ=0
FLZ=30000,BLZ=-3000
FEXY;SP 10000,10000;BGXY;AMXY;PR 3000,3000;SP 500,500;BGXY;AMXY
FEXY;SP 500,500;BGXY;AMXY;PR 3000,3000;SP 2000,2000;BGXY;AMXY
DP 0,-703;JS#TUNE;POS_VAL=1;HOMING=0;EN
```

REM !!!! Move To Stand-By Routine (Thread 1) !!!!

```
#MV_SBY;JS#DR_CLOS;JS#ALLUP;SP 60000,60000,100000/SCALE_Z
AC 150000,150000,150000/SCALE_Z,DC 150000,150000,150000/SCALE_Z
SH;DELTAS=@ABS[_TPX-PT_SBY[0]]+@ABS[_TPY-PT_SBY[1]]+@ABS[_TPZ-PT_SBY[2]]
JS#SAFEZ,DELTAS>10
PA PT_SBY[0],PT_SBY[1],PT_SBY[2];BGXY;AMXY;BGZ;AMZ
JS#TUNE;ST_BY=1;EN
```

REM !!!! Flush/Fill Main Screen !!!!

```
#SOFL_MN
JS#FKEYREL
FNF_FLAG=0
JS#S006
AC 100000,100000,100000
DC 50000,50000,50000
SP 50000,50000,100000/SCALE_Z
JS#DR_CLOS;JS#SAFEZ;PA PT_APG[0],PT_APG[1],PT_APG[2];BGXY;AMXY
BGZ;AMZ;'JS#H1DW';'JS#H2DW';'JS#H3DW'
#SOFL_LP
JP#SOFL_END,@IN[FKEY1]=0
JP#SO_FLSH,@IN[FKEY3]=0
JP#MAT_FIL,@IN[FKEY4]=0
JP#SO_FNF,@IN[FKEY6]=0
IF (FNF_FLAG=1)
FNF_FLAG=0
ENDIF
JP#SOFL_LP
```

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```
#SOFLEND
JS#FKEYREL
JS#ALLUP
JP#CS_MN1
```

```
#SO_FLSH
JS#S007
JS#SOLV
WT1500
JS#H1DW;JS#H2DW;JS#H3DW
JS#H1VLON;JS#H2VLON;JS#H3VLON
TEMP_TM=TIME
#WT_FLSH
JP#ABRTSF,(((IN[FKEY1]=0)&(ACFLAG=0))
JP#WT_FLSH,((TIME-TEMP_TM)<FLUSH_TM)
#ABRTSF2
JS#H1VLOF;JS#H2VLOF;JS#H3VLOF
JS#S006,ACFLAG=0
JP#SOFL_LP,((FNF_FLAG=0)&(ACFLAG=0))
```

```
#MAT_FIL
JS#S008
JS#MATV
WT1500
JS#H1DW;JS#H2DW;JS#H3DW
JS#H1VLON;JS#H2VLON;JS#H3VLON
TEMP_TM=TIME
#WT_FILL
JP#ABRTMF,(((IN[FKEY1]=0)&(ACFLAG=0))
JP#WT_FILL,((TIME-TEMP_TM)<FILL_TM)
#ABRTMF2
JS#H1VLOF;JS#H2VLOF;JS#H3VLOF
JS#S006,ACFLAG=0
JS#FKEYREL
FNF_FLAG=0
JP#SOFL_LP,(ACFLAG=0)
EN
```

```
#ABRTSF
JP#ABRTSF,(@IN[FKEY1]=0)
FNF_FLAG=0
JP#ABRTSF2
```

```
#ABRTMF
JP#ABRTMF,(@IN[FKEY1]=0)
JP#ABRTMF2
```

```
#SO_FNF
FNF_FLAG=1
JP#SO_FLSH
```

```
#AC_FNF
JP#AC_FNF,_XQ2>0
```

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```

JS#ALLUP
JS#SAFEZ
AC 100000,100000,100000
DC 50000,50000,50000
SP 50000,50000,100000/SCALE_Z
JS#DR_CLOS;JS#SAFEZ;PA PT_APG[0],PT_APG[1],PT_APG[2];BGXY;AMXY
BGZ;AMZ;JS#H1DW;JS#H2DW;JS#H3DW

FNF_FLAG=0
IF (@OUT[oSOLV]=1)
  JS#SO_FLSH
ELSE
  JS#MAT_FIL
ENDIF
JS#S020
FLSO_TM=TIME
SOL_TM=TIME
JS#ALLUP
JS#SAFEZ
JS#MV_SBY
EN

REM !!!! Move To Solvent Cup Routine (Thread 1) !!!!
#MV_SOL;JS#DR_CLOS;SP 100000,100000,100000/SCALE_Z
AC 200000,200000,200000/SCALE_Z;DC 200000,200000,200000/SCALE_Z
SH;DELTAS=@ABS[_TPX-PT_SOL[0]]+@ABS[_TPY-PT_SOL[1]]+@ABS[_TPZ-PT_SOL[2]]
JS#S039,DELTAS>10;JS#SAFEZ,DELTAS>10
PA PT_SOL[0],PT_SOL[1],PT_SOL[2];BGXY;AMXY;BGZ;AMZ
JS#H1DW;JS#H2DW;JS#H3DW;JS#TUNE,ST_BY=0;EN

REM !!!! Cyclestop Routine (Thread 1) !!!!
#CS_MN;JP#CS_MN,FPOWER=0;JS#S002;JS#WAIT_F1;JS#MV_HOME
#CS_MN1;JS#ALLUP;JP#CS_MN1,FPOWER=0;JP#CS_MN,POS_VAL=0;JS#MV_SOL,SO_EN=1
JS#MV_SBY,SO_EN=0;CSTOP=0;ACFLAG=0

IF (SOLVENT=1)
  JS#SOLV
ELSE
  JS#MATV
ENDIF

WT400;JS#S003;JS#FKEYREL
#CS_LP;JP#PG_MN,@IN[FKEY1]=0
JP#SOFL_MN,@IN[FKEY2]=0
JP#CA_MN,@IN[FKEY3]=0
JP#MA_MN,@IN[FKEY4]=0;JP#AC_MN,@IN[FKEY5]=0;JP#ST_MN,@IN[FKEY6]=0
JP#SU_MN,@IN[FKEY8]=0
JS#CS_AP,(AP_TE*AP_OUT*(1-SO_EN))>AP_TIME;JP#CS_LP
#CS_AP,XQ#A_PURGE,2
#CS_AP1;JP#CS_AP1,PING=1;JS#S003;EN

REM !!!! Program Selection (Thread 1) !!!!
#PG_MN;JS#S004
#PG_MN1;JS#S005;JS#FKEYREL

```

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```
#PG_LP,JP#PG_BV,@IN[FKEY1]=0
JP#PG_DW,@IN[FKEY2]=0;JP#PG_UP,@IN[FKEY3]=0;JP#PG_LP
#PG_BV;JS#S100;JS#LPPROG;JS#FKEYREL;JP#CS_MN1
#PG_DW;CPROG=CPROG-1;JP#PG_MN1,CPROG>0;CPROG=KNPROG;JP#PG_MN1
#PG_UP;CPROG=CPROG+1;JP#PG_MN1,CPROG-1<KNPROG;CPROG=1;JP#PG_MN1
```

REM !!!! Teach Routines (Thread 1) !!!!

```
#TE_F2;KEY=22*TEACH;JP#TE_FA,RKEY=53;JP#TE_FA,(TIME-TETIME)>1000;JP#TE_F2
#TE_FA;JP#TE_FB,RKEY=53;KEY=0;RKEY=0;JS#FKEYREL;JS#TKEYREL;EN
#TE_FB;CB6;WT50;SB6;KEY=0;WT100;RKEY=0;JS#FKEYREL;JS#TKEYREL;EN
#TE_PB;HX2;HX3;ST;AM;JS#S076;KEY=44*TEACH;WT2000;KEY=0;JP#MA_MN1
#TE_RS;HX0;WT100;XQ#SCAN,0;JS#DR_CLOS;TEACH=0;KEY=0;PASSED=1
SP 60000,60000,100000/SCALE_Z
JP#TE_RS1,PMX>1;PAZ=0;BGZ;AMZ
#TE_RS1;CS;XQ#PROG,2;PLYBCK=0
#TE_RS2;JP#TE_RS2,_XQ2>0;ST;AM;JP#MA_MN1
```

REM !!!! Calibration Routine (Thread 1) !!!!

```
#CA_MN;JS#S009;JS#ALLUP;JS#FKEYREL
SP 30000,30000,60000/SCALE_Z
AC 100000,100000,100000/SCALE_Z
DC 50000,50000,50000/SCALE_Z;JS#SAFEZ
PA PT_CAL[0],PT_CAL[1],PT_CAL[2];BGXY;AMXY
BGZ;AMZ;JS#H2DW;DRFLAG=0
#CA_LP;JP#CS_MN1,@IN[FKEY1]=0;JP#CA_HOME,@IN[FKEY3]=0;JP#CA_LP
#CA_HOME;JS#MV_HOME;JP#CA_MN
```

REM !!!! Manual Mode Functions (Thread 1) !!!!

#MA_MN

JS#FKEYREL

REM !!!! Warn if Solvent in Lines !!!

IF (@OUT[oSOLV]=0)

JS#S013

#SO_WRN2

JP#CS_MN1,@IN[FKEY1]=0

JP#IGNWRN2,@IN[FKEY2]=0

JP#SO_WRN2

#IGNWRN2

JS#FKEYREL

ENDIF

JS#MV_SBY

#MA_MN1;DRFLAG=0;CTM=0;TEACH=1;KEY=0;PLYBCK=0;RKEY=0

CAXIS=1;JS#S010;JS#FKEYREL;HX2;XQ#TB_XY,2;MODE=1

#MA_LP,JP#MA_END,@IN[FKEY1]=0;TETIME=TIME;JS#TE_F2,@IN[FKEY2]=0

JS#VV_MN,@IN[FKEY3]=0;JP#OS_MN,@IN[FKEY4]=0;JS#PR_MN,@IN[FKEY5]=0

JS#TP_MN,@IN[FKEY6]=0;JS#AX_MN,@IN[FKEY8]=0;JP#TE_PB,PLYBCK=1

JS#RM_TCH,(@IN[iTEACH]+@IN[iPURGE]+@IN[iAXIS])<3;JP#MA_LP

#MA_END;JS#LED_RS;TEACH=0;JS#FKEYREL;HX2;ST;AM;VLV=VSTORE

MODE=0;JS#DR_CLOS;JS#ALLUP;JP#CS_MN1

REM !!!! Valve Function Routines (Thread 1) !!!!

#VV_MN;JS#S016;JS#FKEYREL;MODE=3

#VV_LP,JP#VV_END,@IN[FKEY1]=0;JS#PR_MN,@IN[FKEY2]=0;JS#VV_SEL,@IN[FKEY3]=0

JS#VV_UP,@IN[FKEY4]=0;JS#VV_DW,@IN[FKEY5]=0;JS#VV_RA,@IN[FKEY6]=0

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```
JS#VV_RB,@IN[FKEY7]=0;JP#NOOP,PLYBCK=1
JS#RM_TCH,(@IN[iTEACH]+@IN[iPURGE]+@IN[iAXIS])<3;JP#VV_LP
#VV_END;JS#S010;JS#FKEYREL;MODE=1;EN
#VV_SEL;CHEAD=CHEAD+1;JP#VV_SEL1,CHEAD-1<KNHEAD;CHEAD=1
#VV_SEL1;JS#FKEYREL;JS#S012;JS#S017;EN
#VV_UP;JS#H1UP,CHEAD=1;JS#H2UP,CHEAD=2;JS#H3UP,CHEAD=3;JS#FKEYREL;EN
#VV_DW;JS#H1DW,CHEAD=1;JS#H2DW,CHEAD=2;JS#H3DW,CHEAD=3;JS#FKEYREL;EN
#VV_RA;JS#H1RA,CHEAD=1;JS#H2RA,CHEAD=2;JS#H3RA,CHEAD=3;JS#FKEYREL;EN
#VV_RB;JS#H1RB,CHEAD=1;JS#H2RB,CHEAD=2;JS#H3RB,CHEAD=3;JS#FKEYREL;EN

REM !!!! One-Shot Routine (Thread 1) !!!!
#OS_MN;ST;AM;HX2;TEACH=0;WT200;ACFLAG=1;JS#MV_SBY;ACFLAG=0;DRFLAG=0
JS#LPPROG;JS#S022,CTM=0;JS#FKEYREL
#OS_LP,JP#MA_MN,@IN[FKEY1]=0;JP#OS_RUNW,@IN[FKEY2]=0
JP#OS_RUND,@IN[FKEY3]=0;JP#OS_LP
#OS_RUN;JS#AC_LL,VLV=1;JS#DR_CLOS,CTM=0;JS#S021
JS#FKEYREL;CS;CTM=TIME;XQ#PROG,2
#OS_RUN1,JP#OS_RUN1,XQ2>0;ACFLAG=1;JS#MV_SBY;ACFLAG=0;CTM=TIME-CTM
#OS_RUN2;CCNT=CCNT+1;JP#OS_MN
#OS_RUNW;VLV=1;JP#OS_RUN
#OS_RUND;VLV=0;JP#OS_RUN

REM !!!! Manual Purge (Thread 1) !!!!
#PR_MN;VLV=1;JS#H1VLON,CHEAD=1;JS#H2VLON,CHEAD=2;JS#H3VLON,CHEAD=3
JS#FKEYREL;JS#TKEYREL;JS#H1VLOF,CHEAD=1;JS#H2VLOF,CHEAD=2;JS#H3VLOF,CHEAD=3;EN

REM !!!! Tell Position Routine (Thread 1) !!!!
#TP_MN;JS#CLS;JS#S041;JS#FKEYREL;JS#S010;EN

REM !!!! Select Axis Routines (Thread 1) !!!!
#AX_MN;JS#S015;JS#FKEYREL;MODE=2
#AX_LP,JP#AX_END,@IN[FKEY1]=0,TETIME=TIME;JS#TE_F2,@IN[FKEY2]=0
JS#PR_MN,@IN[FKEY3]=0;JS#AX_XY,@IN[FKEY4]=0;JS#AX_X,@IN[FKEY5]=0
JS#AX_Y,@IN[FKEY6]=0;JS#AX_Z,@IN[FKEY7]=0;JP#NOOP,PLYBCK=1
JS#RM_TCH,(@IN[iTEACH]+@IN[iPURGE]+@IN[iAXIS])<3;JP#AX_LP
#AX_END;JS#FKEYREL;JS#S010;MODE=1;EN
#AX_XY;CAXIS=1;JS#AX_SCR;JS#LED_XY;SX=FSTX;SY=FSTY;SZ=0;JP#AX_DN
#AX_X;CAXIS=2;JS#AX_SCR;JS#LED_X;SY=0;SX=FSTX;SZ=0;JP#AX_DN
#AX_Y;CAXIS=3;JS#AX_SCR;JS#LED_Y;SX=0;SY=FSTY;SZ=0;JP#AX_DN
#AX_Z;CAXIS=4;JS#AX_SCR;JS#LED_Z;SX=0;SY=0;SZ=FSTZ;JP#AX_DN
#AX_SCR;JS#S011,MODE=2;JS#S011B,MODE=1;EN
#AX_DN;JS#FKEYREL;JS#TKEYREL;EN

REM !!!! Auto Cycle Routines (Thread 1) !!!!
#AC_MN
JS#FKEYREL
JS#AC_LL,VLV=1
REM !!!! Warn if Solvent in Lines !!!
IF (@OUT[oSOLV]=0)
JS#S013
#SO_WRN
JP#CS_MN1,@IN[FKEY1]=0
JP#IGN_WRN,@IN[FKEY2]=0
JP#SO_WRN
```



```
#IGN_WRN
ENDIF
JS#FKEYREL
ACFLAG=1
JS#LPPROG;CTM=0;JS#A_PURGE,SO_EN=1
JP#AC_MN1,@IN[iSTART]=1;FLSO_TM=TIME;JS#S045
#AC_MNX;JP#AC_MNX,@IN[iSTART]=0
#AC_MN1;SOL_TM=TIME;JS#S020;JS#FKEYREL
#AC_LP
JP#AC_END,@IN[FKEY1]=0
JS#AC_LL,VLV=1
JS#AC_DR,_XQ2<0
JS#AC_SO,((TIME-SOL_TM)*ST_BY*SO_EN)>SLP_TM
JP#AC_S,@IN[iSTART]=0
JS#AC_AP,(AP_TE*AP_OUT*(1-SO_EN))>AP_TIME
JS#AC_FNF,(((TIME-FLSO_TM)*FNF_EN)>FNF_TM)
JP#AC_LP
#AC_END;JP#AC_END,PING=1;JS#S100;ACFLAG=0;JP#CS_MN1
#AC_S;JP#AC_S1,ST_BY=1,XQ#A_PURGE,2
#AC_S1;JS#DR_CLOS;JP#AC_S1,PING=1,CTM=0;CS;JS#S021;JS#FKEYREL
CTM=TIME;XQ#PROG,2
#AC_2;JP#AC_2,_XQ2>0;JP#AC_2,@IN[iSTART]=0
CCNT=CCNT+1;JS#MV_SBY;CTM=TIME-CTM;DRFLAG=0;JP#AC_MN1
#AC_AP;JP#NOOP,PING=1;JS#A_PURGE;JS#S020;EN
#AC_DR;DRFLAG=0;EN
#AC_LL;LL_VAR=14;JP#AC_LLE,@IN[iLEVELA]&LLA_EN=1;LL_VAR=39
JP#AC_LLE,@IN[iLEVELB]&LLB_EN=1;EN
#AC_LLE;LL_ERR=LL_VAR;WT999;EN
```

REM !!!! Move to Solvent Cups !!!!

```
#AC_SO;JS#ALLUP;JP#AC_SO,_XQ2>0;JS#MV_SOL;JS#S020;EN
```

REM !!!! Status Routines (Thread 1) !!!!

```
#ST_MN;JS#S024
#ST_LP;JP#ST_END,@IN[FKEY1]=0;JP#ST_SS,@IN[FKEY3]=0;JP#ST_LP
#ST_END;JP#CS_MN1
#ST_SS;JS#SS_MN;JP#ST_MN
```

REM !!!! Setup Routines (Thread 1) !!!!

```
#SU_MN;JS#S030;JS#SU_SCR
#SU_LP;JP#SU_END,@IN[FKEY1]=0
JP#SU_CNT,@IN[FKEY2]=0;JP#SU_CRS,@IN[FKEY3]=0
JP#SFMF_SU,@IN[FKEY4]=0
JS#SU_APON,@IN[FKEY5]=0;JS#SU_APOF,@IN[FKEY6]=0
JS#SU_WET,@IN[FKEY7]=0;JS#SU_DRY,@IN[FKEY8]=0;JP#SU_LP
#SU_END;JS#FKEYREL;JS#S100;VLV=VSTORE;JP#CS_MN1
#SU_CNT;JS#S031;JS#FKEYREL;JP#SU_MN
#SU_CRS;CCNT=0;JS#S100;JP#SU_MN
#SU_APON;AP_EN=1;JP#SU_SCR
#SU_APOF;AP_EN=0;JP#SU_SCR
#SU_WET;VSTORE=1;JP#SU_SCR
#SU_DRY;VSTORE=0
#SU_SCR;JS#FKEYREL;LCD1=AP_EN;LCD3=VSTORE;JS#S025;EN
```


REM !!!! Solvent Flush/Material Fill Setup Options !!!!

#SFMF_SU

JS#FKEYREL

JS#S0301

JS#S0301A

JS#S0301B

#SFMF_LP

JP#SFMFEND,(@IN[FKEY1]=0)

JP#ACSF_MN,(@IN[FKEY3]=0)

JS#SF_UP,(@IN[FKEY5]=0)

JS#SF_DW,(@IN[FKEY6]=0)

JS#MF_UP,(@IN[FKEY7]=0)

JS#MF_DW,(@IN[FKEY8]=0)

JP#SFMF_LP

EN

#SF_UP

STP_TM=TIME;STEP=1000

#SF_UP1

FLUSH_TM=FLUSH_TM+STEP;JS#SF_RS1,FLUSH_TM>MAX_FLSH;JS#S0301A;WT75

JS#STEP_C,(TIME-STP_TM)>2500;JP#SF_UP1,@IN[FKEY5]=0

EN

#SF_DW

STP_TM=TIME;STEP=1000

#SF_DW1

FLUSH_TM=FLUSH_TM-STEP;JS#SF_RS0,FLUSH_TM<MIN_FLSH;JS#S0301A;WT75

JS#STEP_C,(TIME-STP_TM)>2500;JP#SF_DW1,@IN[FKEY6]=0

EN

#MF_UP

STP_TM=TIME;STEP=1000

#MF_UP1

FILL_TM=FILL_TM+STEP;JS#MF_RS1,FILL_TM>MAX_FILL;JS#S0301B;WT75

JS#STEP_C,(TIME-STP_TM)>2500;JP#MF_UP1,@IN[FKEY6]=0

EN

#MF_DW

STP_TM=TIME;STEP=1000

#MF_DW1

FILL_TM=FILL_TM-STEP;JS#MF_RS0,FILL_TM<MIN_FILL;JS#S0301B;WT75

JS#STEP_C,(TIME-STP_TM)>2500;JP#MF_DW1,@IN[FKEY7]=0

EN

#SFMFEND

JP#SFMFEND,@IN[FKEY1]=0

JP#SU_MN

#S0301;JS#CLS

JS#L1;MG{P2}{N}"F&F: AUTO Flsh s. Fil s."

JS#L2;MG{P2}{N}"EXIT OPT UP DW UP DW ";EN

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```
#S0301A;MG{P2}{N}{^17},{^25},{^150},{^18},{FLUSH_TM/1000}{F3.0};EN
#S0301B;MG{P2}{N}{^17},{^25},{^161},{^18},{FILL_TM/1000}{F3.0};EN
```

```
#SF_RS1;FLUSH_TM=MIN_FLSH;STP_TM=TIME;EN
#SF_RS0;FLUSH_TM=MAX_FLSH;STP_TM=TIME;EN
#MF_RS1;FILL_TM=MIN_FILL;STP_TM=TIME;EN
#MF_RS0;FILL_TM=MAX_FILL;STP_TM=TIME;EN
#STEP_C;STEP=STEP*5;STP_TM=TIME;EN
#STEP_D;STEP=STEP*10;STP_TM=TIME;EN
```

REM !!!!Auto Cycle Solvent Flush Options!!!

```
#ACSF_MN
JS#FKEYREL
JS#S0302
JS#S0302A
JS#S0302B
#ACSF_LP
JP#SFMF_SU,(@IN[FKEY1]=0)
JS#FNF_ON,@IN[FKEY3]=0
JS#FNF_OF,@IN[FKEY4]=0
JS#FNF_UP,@IN[FKEY5]=0
JS#FNF_DW,@IN[FKEY6]=0
JP#ACSF_LP
```

```
#FNF_UP
STP_TM=TIME;STEP=60000
#FNF_UP1
FNF_TM=FNF_TM+STEP;JS#FNF_RS1,FNF_TM>MAX_FNF;JS#S0302A;WT75
JS#STEP_D,(TIME-STP_TM)>2500;JP#FNF_UP1,@IN[FKEY5]=0
EN
```

```
#FNF_DW
STP_TM=TIME;STEP=60000
#FNF_DW1
FNF_TM=FNF_TM-STEP;JS#FNF_RS0,FNF_TM<MIN_FNF;JS#S0302A;WT75
JS#STEP_D,(TIME-STP_TM)>2500;JP#FNF_DW1,@IN[FKEY6]=0
EN
```

```
#S0302;JS#CLS
JS#L1;MG{P2}{N}"Auto Opt: F&F Freq min "
JS#L2;MG{P2}{N}"EXIT ON OFF UP DW ";EN
```

```
#S0302A
MG{P2}{N}{^17},{^25},{^151},{^18},{FNF_TM/60000}{F3.0}
EN
```

```
#S0302B
MG{P2}{N}{^17},{^25},{^202},{^18},ASTRSK[FNF_EN]{S}
MG{P2}{N}{^17},{^25},{^206},{^18},ASTRSK[FNF_EN+2]{S};EN
```

```
#FNF_ON;FNF_EN=1;JS#S0302B;JS#FKEYREL;EN
#FNF_OF;FNF_EN=0;JS#S0302B;JS#FKEYREL;EN
```

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```
#FNF_RS1,FNF_TM=MIN_FNF;STP_TM=TIME;EN
#FNF_RS0,FNF_TM=MAX_FNF;STP_TM=TIME;EN
```

REM !!!! Auto Purge (Thread 2) !!!!

#A_PURGE

```
AP_OUT=0;PING=1;VLV=1;JS#S040
AC 100000,100000,100000
DC 50000,50000,50000
SP 50000,50000,100000/SCALE_Z
JS#DR_CLOS;JS#SAFEZ;PA PT APG[0],PT APG[1],PT APG[2];BGXY;AMXY
BGZ;AMZ;JS#H1DW;JS#H2DW;JS#H3DW;JS#H1VLON;JS#H2VLON;JS#H3VLON;WT AP_LEN
JS#H1VLOF;JS#H2VLOF;JS#H3VLOF;JS#H1UP;JS#H2UP;JS#H3UP;WT200
JS#MV_SBY;AP_TE=0;AP_TP=TIME;VLV=VSTORE
PING=0;AP_OUT=1;EN
```

REM !!!! Trackball (Thread 2) !!!!

#TB_XY;ST;AM

```
DC 125000,125000,960000/SCALE_Z
AC 125000,125000,425000/SCALE_Z;JS#LED_XY
SX=FSTX;SY=FSTY;SZ=0;DE*=0;MX=0;MY=0;MZ=0;MXL=0
MYL=0;MZL=0;MT=TIME;DE MXL,MYL,MZL;MTL=MT;SH;JG 0,0,0;BGXYZ
#TB_XY1;DT=MT-MTL;MTL=MT;MT=TIME;MXL=MX;MYL=MY;MZL=MZ
MZ=DEX;MX=DEX;MY=DEY;MDT=MT-MTL;VELX=SX*(MX-MXL)/MDT
VELY=SY*(MY-MYL)/MDT;VELZ=SZ*(MZ-MZL)/MDT;JP#MCHKZP,CAXIS=4
#MCHKXP;JP#MCHKXN,VELX<0;JP#MCHKYP,_TPX+1000<_FLX;VELX=0;JP#MCHKYP
#MCHKXN;JP#MCHKYP,_TPX-1000>_BLX;VELX=0
#MCHKYP;JP#MCHKYN,VELY<0;JP#TB_XY2,_TPY+1000<_FLY;VELY=0;JP#TB_XY2
#MCHKYN;JP#TB_XY2,_TPY-1000>_BLY;VELY=0;JP#TB_XY2
#MCHKZP;JP#MCHKZN,VELZ<0;JP#TB_XY2,_TPZ+1000<_FLZ;VELZ=0;JP#TB_XY2
#MCHKZN;JP#TB_XY2,_TPZ-1000>_BLZ;VELZ=0
#TB_XY2;JG VELX,VELY,VELZ;JP#TB_XY1
```

REM !!!! Teach Pendant Routines (Thread 1) !!!!

```
#RM_TCH;JS#RM_AX,@IN[iAXIS]=0;JS#PR_MN,@IN[iPURGE]=0
TETIME=TIME;JS#TE_F2,@IN[iTEACH]=0;EN
#RM_AX;CAXIS=CAXIS+1;JS#RM_AR,CAXIS>4;JS#AX_XY,CAXIS=1
JS#AX_X,CAXIS=2;JS#AX_Y,CAXIS=3;JS#AX_Z,CAXIS=4;EN
#RM_AR;CAXIS=1;EN
#LED_XY;SB3;SB4;CB1;CB2;EN
#LED_X;SB2;SB3;SB4;CB1;EN
#LED_Y;SB1;SB3;SB4;CB2;EN
#LED_Z;SB1;SB2;SB4;CB3;EN
#LED_W;SB1;SB2;SB3;CB4;EN
#LED_RS;SB1;SB2;SB3;SB4;SB6;EN
```

REM !!!! LCD Screens !!!!

```
#INITLCD;CC 9600,0,0,0;WT500;JS#CLS;EN
#CLS;MG{P2}{N}{^17},{^12},{^01},{^02},{^18};EN
#L1;MG{P2}{N}{^17},{^25},{^128},{^18};EN
#L2;MG{P2}{N}{^17},{^25},{^192},{^18};EN
```

```
#S001;JS#CLS
JS#L1;MG{P2}{N}"Precision Valve & Automation";MG{P2}{N}" Inc"
JS#L2;MG{P2}{N}"System Initialization, please ";MG{P2}{N}"wait... ";EN

#S002;JS#CLS;JS#L1;MG{P2}{N}"Press F1 to home the system. ";EN

#S003;JS#CLS
JS#L1;MG{P2}{N}"Cycle Stop ";MG{P2}{N}" "
JS#L2;MG{P2}{N}"PROG F&F CAL MAN AUTO STAT";MG{P2}{N}" SETUP";EN

#S004;JS#CLS
JS#L1;MG{P2}{N}"Select Program: ",A_PROGA[CPROG]{S},A_PROGB[CPROG]{S}
JS#L2;MG{P2}{N}"EXIT PREV NEXT";EN

#S005
MG{P2}{N}{^17},{^25},{^144},{^18},A_PROGA[CPROG]{S},A_PROGB[CPROG]{S};EN

#S006;JS#CLS
JS#L1;MG{P2}{N}" SOLV MAT ";MG{P2}{N}"FLSH& "
JS#L2;MG{P2}{N}"EXIT FLSH FILL ";MG{P2}{N}"FILL ";EN

#S007;JS#CLS
JS#L1;MG{P2}{N}"Solvent Flush in Progress... ";MG{P2}{N}" "
JP#NOOP,(ACFLAG=1)
JS#L2;MG{P2}{N}"EXIT ";MG{P2}{N}" ";EN

#S008;JS#CLS
JS#L1;MG{P2}{N}"Material Fill in Progress... ";MG{P2}{N}" "
JP#NOOP,(ACFLAG=1)
JS#L2;MG{P2}{N}"EXIT ";MG{P2}{N}" ";EN

#S009;JS#CLS;JS#L1;MG{P2}{N}"Calibration"
JS#L2;MG{P2}{N}"EXIT HOME ";MG{P2}{N}" ";EN

#S010;JS#CLS;JS#L1;MG{P2}{N}"Jog Mode Head: ",A_HEAD[CHEAD]{S}
MG{P2}{N}A2HEAD[CHEAD]{S}," Axis: ",AXIS[CAXIS]{S}
JS#L2;MG{P2}{N}"EXIT TEACH VLV RUN PURG TP ";MG{P2}{N}" AXIS";EN

#S011;MG {P2}{N}{^17},{^25},{^157},{^18},AXIS[CAXIS]{S};EN

#S011B;MG {P2}{N}{^17},{^25},{^164},{^18},AXIS[CAXIS]{S};EN

#S012;MG {P2}{N}{^17},{^25},{^153},{^18},A_HEAD[CHEAD]{S},A2HEAD[CHEAD]{S};EN

#S013;JS#CLS
JS#L1;MG{P2}{N}"Warning! Solvent not been";MG{P2}{N}" flushed! "
JS#L2;MG{P2}{N}"EXIT CONT ";MG{P2}{N}" ";EN

#S015;JS#CLS
JS#L1;MG{P2}{N}"Trackball Control Current: ",AXIS[CAXIS]{S}
JS#L2;MG{P2}{N}"EXIT TEACH PURG X&Y X Y ";MG{P2}{N}" Z ";EN

#S016;JS#CLS;JS#L1;MG{P2}{N}"Valve Functions Head: "
MG{P2}{N} A_HEAD[CHEAD]{S},A2HEAD[CHEAD]{S}
```

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```
JS#L2;MG{P2}{N}"EXIT PURG SEL UP DOWN ";MG{P2}{N}"
#S017;JP#OPT3,R_HEAD[CHEAD]=1
MG{P2}{N}{^17},{^25},{^218},{^18},"";EN
#OPT3;MG{P2}{N}{^17},{^25},{^218},{^18},"ROTA,ROTB";EN
#S019;JS#CLS;JS#L1;MG{P2}{N}"Homing axes. Please wait... ";EN
#S020;JS#CLS;JP#OPT1,VLV=0
JS#L1;MG{P2}{N}"Auto Cycle WET Count:{F8.0}CCNT;JP#OPT2
#OPT1;JS#L1;MG{P2}{N}"Auto Cycle DRY Count:{F8.0}CCNT
#OPT2;JS#L2;MG{P2}{N}"STOP "
MG{P2}{N} A_PROGA[CPROG]{S},A_PROGB[CPROG]{S};JP#NOOP,AC_TMR=0
JP#NOOP,CTM=0,MG{P2}{N}" ",{F3.1}CTM*0.9766/1000," Sec.";EN
#S021;JS#CLS
JS#L1;MG{P2}{N}"In Cycle... Count:{F8.0}CCNT;JP#OPT2
#S022;JS#CLS
JS#L1;MG{P2}{N}"Press F2 or F3 to run";MG{P2}{N}" 1 cycle. "
JS#L2;MG{P2}{N}"EXIT WET DRY ",A_PROGA[CPROG]{S},A_PROGB[CPROG]{S}
JP#NOOP,AC_TMR=0;JP#NOOP,CTM=0;MG{P2}{N}" ",{F3.1}CTM*0.9766/1000," Sec.";EN
#S024;JS#CLS;JS#L1;MG{P2}{N}"Status"
JS#L2;MG{P2}{N}"EXIT STAT ";MG{P2}{N}" ";EN
#S025;LCD2=LCD1+2;LCD4=LCD3+2
MG{P2}{N}{^17},{^25},{^213},{^18},ASTRSK[LCD1]{S}
MG{P2}{N}{^17},{^25},{^218},{^18},ASTRSK[LCD2]{S}
MG{P2}{N}{^17},{^25},{^223},{^18},ASTRSK[LCD3]{S}
MG{P2}{N}{^17},{^25},{^228},{^18},ASTRSK[LCD4]{S};EN
#S030;JS#CLS
JS#L1;MG{P2}{N}"Setup Counter F&F Auto Purg";MG{P2}{N}"e Run Mode"
JS#L2;MG{P2}{N}"EXIT CNT RES OPT ON OFF";MG{P2}{N}" WET DRY";EN
#S031;JS#CLS;JS#L1;MG{P2}{N}"Count:{F8.0}CCNT;EN
#S039;JS#CLS;JS#L1;MG{P2}{N}"Moving to Solvent!!!";EN
#S040;JS#CLS;JS#L1;MG{P2}{N}"AUTO PURGE!!!";EN
#S041;JS#CLS;JS#L1;MG{P2}{N}"Current Position: "
JS#L2;MG{P2}{N}"X",_TPX{F6.0},"Y",_TPY,"Z",_TPZ;EN
#S045;JS#CLS;JS#L1;MG{P2}{N}"Start switches activated!"
JS#L2;MG{P2}{N}"Deactivate to continue the pro";MG{P2}{N}"gram. ";EN
#S076;JS#CLS;JS#L1;MG{P2}{N}"Waiting for path...";EN
#S100;JS#CLS
```

JS#L1;MG{P2}{N}"Saving data...please wait.";WT150;BV;JS#FKEYREL;EN

#S159;JS#CLS

JS#L1;MG{P2}{N}"Checking for exhaust input. Ple";MG{P2}{N}"ase wait.";EN

#S160;JS#CLS

JS#L1;MG{P2}{N}"Verifying exhaust. Please wait.";MG{P2}{N}";EN

#S161;JS#L2;MG{P2}{N}"",{F3.0}(FAN_WT/1000);EN

#S198;JS#CLS;JS#L1;MG{P2}{N}ECOD1[MEC]{S},ECOD2[MEC]{S}

MG{P2}{N}ECOD3[MEC]{S},ECOD4[MEC]{S},ECOD5[MEC]{S}

JS#L2;MG{P2}{N}"Press F1 to continue the progr";MG{P2}{N}"am.";MERR=MEC

JS#WAIT_F1;JS#FAN_WT;JP#ESTOP1

#S199;JP#ESTOP1,MERR=MEC;JS#CLS

JS#L1;MG{P2}{N}OPF1[PNEC]{S},OPF2[PNEC]{S},OPF3[PNEC]{S},OPF4[PNEC]{S}

MG{P2}{N}" failure.";JS#L2;MG{P2}{N}"Repair and press F1."

MERR=MEC;JS#WAIT_F1;JS#FKEYREL,VPNT0=0;PNEC=0;JP#ESTOP1

#S200;JP#ESTOP1,MERR=MEC;JS#CLS;JS#L1;MG{P2}{N}ECOD1[MEC]{S},ECOD2[MEC]{S}

MG{P2}{N}ECOD3[MEC]{S},ECOD4[MEC]{S},ECOD5[MEC]{S}

JS#L2;MG{P2}{N}"to continue the program.";MERR=MEC;JP#ESTOP1

#S201;JS#CLS;JS#L1;MG{P2}{N}"Error",{F3.0}ERR," on line",{F4.0}LINE,""

JS#L2;MG{P2}{N}"Press F1 to restart, F5 for st";MG{P2}{N}"atus. ";EN

#S202;JS#CLS

JS#L1;MG{P2}{N}"Position Error. F1-restart, F5-";MG{P2}{N}"status. "

JS#L2;MG{P2}{N}"Stop codes (x,y,z",{F3.0}_SCX,"",{F3.0}_SCY,""

MG{P2}{N}{F3.0}_SCZ;EN

#S203;JS#CLS

JS#L1;MG{P2}{N}"Limit Error. F1-restart, F5-sta";MG{P2}{N}"tus. "

JS#L2;MG{P2}{N}"Stop codes (x,y,z",{F3.0}_SCX,"",{F3.0}_SCY,""

MG{P2}{N}{F3.0}_SCZ;EN

#S204;JS#CLS;JS#L1;MG{P2}{N}"Variable error."

JS#L2;MG{P2}{N}"Initializing...";EN

#S205;JS#CLS

JS#L1;MG{P2}{N}"Unrecoverable variable error d";MG{P2}{N}"uring "

JS#L2;MG{P2}{N}"startup. Restart the machine.";HX

#S206;JS#CLS

JS#L1;MG{P2}{N}"Subroutine error. The subrout";MG{P2}{N}"ine is not"

JS#L2;MG{P2}{N}"stored in segment 1, 2 or 3.";EN

#S208;JP#ESTOP1,MERR=MEC;MERR=MEC;JS#CLS

JS#L1;MG{P2}{N}"Press F1 to return head to sta";MG{P2}{N}"ndby."

JS#L2;MG{P2}{N}" OK";JP#ESTOP1

#S209;JS#CLS;JS#L1;MG{P2}{N}"Press F1 to restart.";JS#L2;MG{P2}{N}" OK";EN


```
#S210;JP#ESTOP1,MERR=MEC;JS#CLS;JS#L1;MG{P2}{N}ECOD1[MEC]{S},ECOD2[MEC]{S}
MG{P2}{N}ECOD3[MEC]{S},ECOD4[MEC]{S},ECOD5[MEC]{S};MERR=MEC
JS#L2;MG{P2}{N}"Press F1 to continue.";JS#WAIT_F1;LL_ERR=0;JP#ESTOP1

REM !!!! Error-Checking Subroutines !!!!
#WAIT_F1;JP#WAIT_F1,@IN[80]=1;JS#FKEYREL;EN

#FKEYREL;VRESUME=@IN[73]&@IN[74]&@IN[75]&@IN[76]
VRESUME=VRESUME&@IN[77]&@IN[78]&@IN[79]&@IN[80]
JP#FKEYREL,VRESUME=0;WT50;EN

#TKEYREL;VRESUME=@IN[iTEACH]&@IN[iPURGE]&@IN[iAXIS]
JP#TKEYREL,VRESUME=0;WT50;EN

#S_ONE;JP#S_ONE,@IN[CKSEN]=0;EN

#S_ZERO;JP#S_ZERO,@IN[CKSEN]=1;EN

#OPT0;TSTART=TIME

#OPT02;JP#NOOP,@IN[SENINP]=ZORO;JP#OPT02,(TIME-TSTART)<PNT0;VPNT0=1;WT999;EN

#DR_CLOS;JP#DR_SHUT,@IN[iDOOR]=1;JS#CLS;JS#L1
MG{P2}{N}"Close door to continue."

#DR_CLO1;JP#DR_CLO1,@IN[iDOOR]<>1

#DR_SHUT;DRFLAG=1;JP#NOOP,TEACH=0;JS#CLS;JS#L1;MG{P2}{N}"Cycle in progress ";EN

#SAFEZ;PAZ=0;BGZ;AMZ;JS#ALLUP,SO_EN=1;EN

REM !!!! Group Subroutines !!!!
#ALLUP;JS#H1UP;JS#H2UP;JS#H3UP;JS#H1RA;JS#H2RA;JS#H3RA;EN

REM !!!! Variable Assignments !!!!
#GETASN;NA=0

REM -----
REM !! Inputs !!
REM -----

iESTOP=1;iSTART=2;iDOOR=3;iBYPASS=4;iPOWER=5
iLEVELA=49;iLEVELB=67
iAXIS=22;iPURGE=23;iTEACH=24
FKEY1=80;FKEY2=79;FKEY3=78;FKEY4=77;FKEY5=76;FKEY6=75;FKEY7=74;FKEY8=73
iFLOW=64

iH1Z=53

iH2Z=54
iH2RB=55
iH2RA=56

REM -----
```

REM !! Outputs !!
REM -----

oH1Z=25
oH1V=27
oH1AT=26

oH2Z=28
oH2V=31
oH2RB=29
oH2RA=30

oSOLV=32
oMATV=33

OPF1[1]="";OPF2[1]="";OPF3[1]="";OPF4[1]=""
OPF1[2]="";OPF2[2]="";OPF3[2]="";OPF4[2]=""
OPF1[3]="";OPF2[3]="";OPF3[3]="";OPF4[3]=""
OPF1[4]="";OPF2[4]="";OPF3[4]="";OPF4[4]=""
OPF1[5]="Spray";OPF2[5]=" Z-";OPF3[5]="slide ";OPF4[5]="UP"
OPF1[6]="Spray";OPF2[6]=" Z-";OPF3[6]="slide ";OPF4[6]="DOWN"
OPF1[7]="Dispen";OPF2[7]="se Z-";OPF3[7]="slide ";OPF4[7]="UP"
OPF1[8]="Dispen";OPF2[8]="se Z-";OPF3[8]="slide ";OPF4[8]="DOWN"
OPF1[9]="HD3";OPF2[9]=" Z-";OPF3[9]="slide ";OPF4[9]="UP"
OPF1[10]="HD3";OPF2[10]=" Z-";OPF3[10]="slide ";OPF4[10]="DOWN"
OPF1[11]="Spray";OPF2[11]=" r";OPF3[11]="otary";OPF4[11]="0 deg"
OPF1[12]="Spray";OPF2[12]=" r";OPF3[12]="otary ";OPF4[12]="45 deg"
OPF1[13]="Dispen";OPF2[13]="se r";OPF3[13]="otary ";OPF4[13]="0 deg"
OPF1[14]="Dispen";OPF2[14]="se r";OPF3[14]="otary ";OPF4[14]="45 deg"
OPF1[15]="HD3";OPF2[15]=" r";OPF3[15]="otary ";OPF4[15]="0 deg"
OPF1[16]="HD3";OPF2[16]=" r";OPF3[16]="otary ";OPF4[16]="45 deg"

ECOD1[1]="Emerge";ECOD2[1]="ncy St";ECOD3[1]="op. Re";ECOD4[1]="set bu"
ECOD5[1]="tton";ECOD1[2]="Left ";ECOD2[2]="Door ";ECOD3[2]="open. "
ECOD4[2]="Close";ECOD5[2]="";ECOD1[3]="";ECOD2[3]="Door "
ECOD3[3]="open. ";ECOD4[3]="Close";ECOD5[3]="";ECOD1[4]="Materi"
ECOD2[4]="al A L";ECOD3[4]="evel l";ECOD4[4]="ow. ";ECOD5[4]=""
ECOD1[5]="Materi";ECOD2[5]="al B L";ECOD3[5]="evel l"
ECOD4[5]="ow. ";ECOD5[5]="";ECOD1[6]="Exhaus";ECOD2[6]="t Flow"
ECOD3[6]=" low. ";ECOD4[6]="";ECOD5[6]="";EN

REM !!!! Machine-Specific Information !!!!

#IMACH;MT 1,1,1;CE 0,0,0
FSTX=20000;SLWX=10000
FSTY=20000;SLWY=10000
FSTZ=10000;SLWZ=5000

KNHEAD=2

A_HEAD[1]="Spray ";A2HEAD[1]=" ";R_HEAD[1]=0
A_HEAD[2]="Dispen";A2HEAD[2]="se ";R_HEAD[2]=1
A_HEAD[3]="HD3";A2HEAD[3]=" ";R_HEAD[3]=1

REM !!! Added Y offset to Home Routine !!!
XOFF=0

3267_M07.txt[8/25/2017 9:15:48 AM]

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EXHIBIT 34
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YOFF=703
ZOFF=0

PT_APG[0]=70700;PT_APG[1]=53663;PT_APG[2]=2478
PT_CAL[0]=6660;PT_CAL[1]=41194;PT_CAL[2]=13921
PT_SBY[0]=33500;PT_SBY[1]=36600;PT_SBY[2]=250
PT_SOL[0]=70850;PT_SOL[1]=27679;PT_SOL[2]=9000

AP_EN=0;AP_LEN=2000;AP_TIME=30000;SLP_TM=30000;SO_EN=1
PNT0=4000;AC_TMR=1;LLA_EN=0;LLB_EN=0;XFL_EN=0

MIN_FLSH=0
MIN_FILL=0
MAX_FLSH=150000
MAX_FILL=150000
MIN_FNF=0
MAX_FNF=18000000

#TUNE;WT100
AC 150000,150000,150000/SCALE_Z
DC 150000,150000,150000/SCALE_Z
SP 60000,60000,100000/SCALE_Z
VA 70000,70000,70000
VD 70000,70000,70000
BL -4000,-2500,-1500
FL 71000,70500,16600
TL 9.9999,9.9999,9.9999
KD 67.99,82.43,305.75
KP 5.66,6.75,199.94
KI 0.25,0.19,0.34;EN

#SCALE;SCALE_Z=10;MO;SF 1,1,SCALE_Z;EN

REM !!!! Pneumatic and Dispensing Subroutines !!!!
#H1VLON;JP#NOOP,VLV=0;CB oH1AT;WT250;CB oH1V;AP_TP=TIME;EN
#H1VLOF;JS#APRS,@OUT[oH1V]=0;SB oH1V;WT50;SB oH1AT;EN
#H1UP;PNEC=5;SENINP=iH1Z;ZORO=1;SB oH1Z;JS#OPTO;EN
#H1DW;PNEC=6;SENINP=iH1Z;ZORO=0;CB oH1Z;JS#OPTO;EN
#H1RA;EN
#H1RB;EN

#H2VLON;JP#NOOP,VLV=0;CB oH2V;AP_TP=TIME;EN
#H2VLOF;JS#APRS,@OUT[oH2V]=0;SB oH2V;EN
#H2UP;PNEC=7;SENINP=iH2Z;ZORO=1;SB oH2Z;JS#OPTO;EN
#H2DW;PNEC=8;SENINP=iH2Z;ZORO=0;CB oH2Z;JS#OPTO;EN
#H2RA;PNEC=13;SENINP=iH2RA;ZORO=0;SB oH2RB;CB oH2RA;JS#OPTO;EN
#H2RB;PNEC=14;SENINP=iH2RB;ZORO=0;SB oH2RA;CB oH2RB;JS#OPTO;EN

#H3VLON;EN
#H3VLOF;EN
#H3UP;EN
#H3DW;EN
#H3RA;EN
#H3RB;EN

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EXHIBIT 34
Software Code: Proprietary/irrelevant

582VA-1279

```
#SOLV
  CB oSOLV
  SB oMATV
  SOLVENT=1
  BV
EN

#MATV
  CB oMATV
  SB oSOLV
  SOLVENT=0
  BV
EN

#NOOP;EN
#APRS;AP_TP=TIME;EN
#EOM
EN
\
```

3267_M07.lxi[8/25/2017 9:15:48 AM]

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EXHIBIT 34
Software Code: Proprietary/irrelevant

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```

REM Machine Style: 350_W3SD
NO Author: JBB Date: 10/09/2006 Version: 1.00
NO Project: SPCX2115 Serial #: W3267 Company: Space.X
NO Modified by: NS Date: 5/1/09
REM PathMaster version: 2.00+
REM
REM =====
REM Revision History
REM =====
REM Change: Date: By:
REM -----
REM - Added Teach Pendant Routines. 7/3/02 TMB
REM - Added Solvent Cup Routines. 7/3/02 TMB
REM - Added Z Axis Scaling (Requires n17e firmware). 2/06/04 TMB
REM 2- Modified Cal routine, Solvent position 6/23/09 AH
REM 3- Added Y offset to Home Routine. 7/2/09 AJH
REM 5- Added Auto Solvent Flush 10/11/13 FP
REM 8- Adjusted purge points 10/24/13 MRL
REM 9- Changed AC FNF to Purge material per time set
    in Setup, will wait for continue and kick back
REM 10- Cycle Stop 11/20/13 FP
REM -----
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REM Precision Valve & Automation.
REM
REM (C) 2006 Precision Valve & Automation, Inc.
REM
REM !!!! Startup And Scan Routines (Thread 0) !!!!
#AUTO;PASSED=0;POS_VAL=0;FANPASS=0
#AUTO1;DOG=40;TRY_RES=0;SDE=0
#AUTO2;AB1;JS#SCALE;JS#PRE_CHK
#SCAN;AP_TE=(TIME-AP_TP)*AP_EN;JP#FESTOP,(@IN[iDOOR])&DRFLAG=1
JP#ESTOP,@IN[iDOOR]=1
JP#ESTOP,(1-@IN[iDOOR])&DRFLAG=1
JP#ESTOP,(1-@IN[iDOOR])&@IN[iBYPASS]=1
JP#ESTOP,LL_ERR<>0;DOG=67
JP#ESTOP,VPNT0=1
JS#OSTOP,(OUTAC+@IN[FKEY1])=0;FPOWER=1;JP#SCAN
#OSTOP,CSTOP=1;EN
#FESTOP,FAN_ERR=1;JP#ESTOP

REM !!!! Auxiliary Error Routines (Thread 1) !!!!
#KEYMON;JP#KEYMON,MERR*(1-@IN[FKEY1])<>-1;KEY1=1;EN

REM !!!! Emergency Stop and Error Routine (Thread 0) !!!!
#ESTOP;ETIME=TIME;HX1;HX2;HX3
OP $EF,$FFFF,$FFFF,$FFFF,$FFFF

```